

# MX673

4822 725 50807

TUNER: ST673/ST673L / AMP: PM673 / CASSETTE DECK: SD873



# marantz®

model MX673

*System Component*

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All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

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### How to use this service manual

- The "Common parts" which Marantz Japan, Inc. has established are eliminated from this service manual.
- These "Common parts" are applied to all models in the service manuals arranged and issued by MJI.
- To indicate clearly the common parts in the schematic diagram, a line is drawn above or under the Ref. Desig. No. of applicable parts.
- "Common parts" can be supplied from the Marantz service center as ever.  
In case of ordering, please establish the parts number of 12 N/C'S following the procedure mentioned in this service manual "How to establish the parts number for common parts".

#### (NOTE)

When you order parts to the Marantz parts center, please take notice of the following points.

- 1) Please correctly write the parts number of 12 N/C'S following the rule.
- 2) Since ordering parts by the Ref. Desig. No. or ratings indicated in the schematic diagram does not satisfy the above conditions, the Marantz parts supply system does not work properly.

As this case is apt to cause a trouble, please pay attention to it.

# AMPLIFIER SECTION

## 1. TEST EQUIPMENT REQUIRED FOR SERVICING

This table lists the test equipment required for servicing the Stereo Amplifier.

Item	Use
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
AC VTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO alignment
Circuit Tester	Trouble shooting
DC VTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to amplifier
Line Voltmeter	Monitors potential of primary power to amplifier
Variable Autotransformer (0 ~ 140V AC, 10A)	Adjust level of primary power to amplifier
Shorting Plug	Shorts amplifier input to eliminate noise pickup

## 2. P.W. BOARDS

As can be seen from the circuit diagram the chassis of Model PM673 consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. Relay ..... mounted on P.W. Board PA14
2. Connector ..... mounted on P.W. Board PJ14
3. Video Amp..... mounted on P.W. Board PL04
4. Pin Jack Switch .... mounted on P.W. Board PL14
5. R.G.B. Connector ... mounted on P.W. Board PL24
6. Selector ..... mounted on P.W. Board PS04
7. Rec Selector ..... mounted on P.W. Board PS34
8. Speaker Switch .... mounted on P.W. Board PS44
9. Function 1 ..... mounted on P.W. Board PS84
10. Function 3 Switch... mounted on P.W. Board PS94
11. Transf. Wire..... mounted on P.W. Board PT24
12. U-CON FL Driver ... mounted on P.W. Board PU04
13. F.I.P. ..... mounted on P.W. Board PU14
14. Tact Switch ..... mounted on P.W. Board PU24
15. U-COM 2 ..... mounted on P.W. Board PU54
16. Speaker Terminal ... mounted on P.W. Board PW04
17. Dolby Surround .... mounted on P.W. Board P604
18. Power Amp. Driver .. mounted on P.W. Board P704
19. TR. L ch ..... mounted on P.W. Board P714
20. TR. R ch ..... mounted on P.W. Board P724
21. TR. Dolby ..... mounted on P.W. Board P734
22. Power Amp./Supply .. mounted on P.W. Board P754

## 3. ADJUSTMENT PROCEDURES

### • Adjustment of Main Amp Idling Current

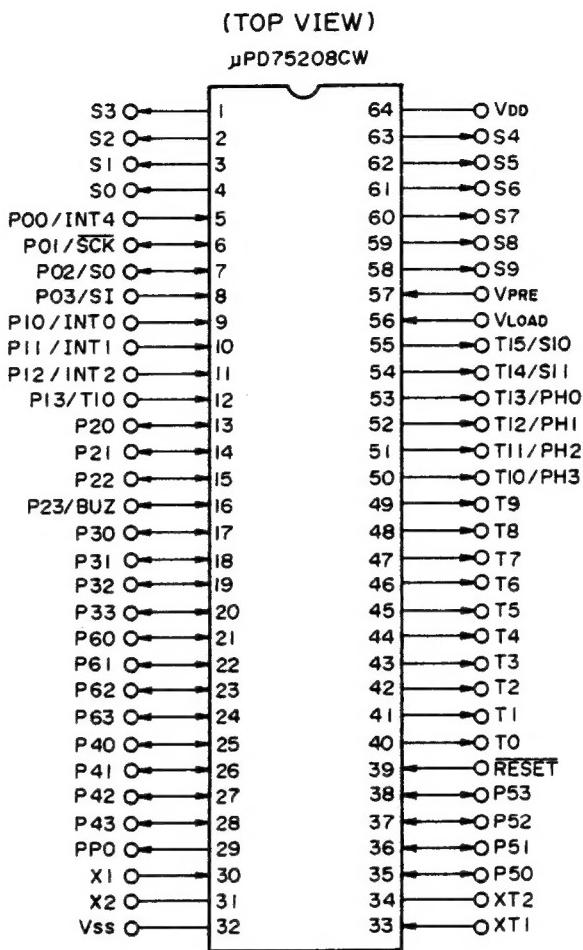
Connect a digital voltmeter to the R755, R756, and R776 emitter resistor adjustment terminals, turn the power on, then adjust variable resistors R711, R712, and R731 when the power becomes stable so that the reading on the voltmeter is between 1 mV and 1.5 mV.

### • Adjustment of Dolby Surround Output Distortion

Input 1 kHz to the L or R input terminals, set the mode switch to Dolby Surround, increase the input for a voltage of 1.6 V at the test point (J601), then adjust variable resistor R630 so that the distortion is minimum.

## 4. CIRCUIT DESCRIPTION

### 1. $\mu$ PD75208 (QU01) 64-pin plastic shrink DIP microprocessor



P00 – P03: Port 0  
 P10 – P13: Port 1  
 P20 – P23: Port 2  
 P30 – P33: Port 3  
 P40 – P43: Port 4  
 P50 – P53: Port 5  
 P60 – P63: Port 6  
 PH0 – PH3: Port H  
 T0 – T1: Digit output  
 SO – S11: Segment output  
 PPO: Pulse output  
 BUZ: Fixed frequency output

SCK: Serial clock input/output  
 SO: Serial output/serial input/output  
 SI: Serial input  
 INT0, INT1: External vector interrupt input  
 INT2: External test input  
 INT4: External vector interrupt input  
 T10: Timer input  
 X1, X2: Main system clock oscillation pin  
 XT1, XT2: Subsystem clock oscillation pin  
 RESET: Reset input  
 VLOAD, VPRE: FIP driver power pin

- Function of Digital Input/Output Port Pins

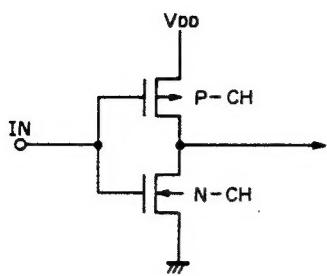
Pin	Input/Output	Pin with which used	Function	Type of Input/Output Circuit	
P00	Input	INT4	4-bit input port (Port 0)	B	
P01	Input/Output	SCK		F	
P02	Input/Output	S0		G	
P03	Input	SI		B	
P10	Input	INT0	w/ noise reduction function	B	
P11		INT1			
P12		INT2	w/ noise reduction function		
P13		T10			
P20	Input/Output	—	4-bit input/output port (Port 2)	E	
P21		—			
P22		—			
P23		BUZ			
P30 – P33	Input/Output	—	Programmable 4-bit input/output port (Port 3) Input/output settable in bit units.	E	
P40 – P43	Input/Output	—	4-bit input/output port (Port 4) Direct drive of LED possible.	E	
P50 – P53	Input/Output	—	4-bit input/output port (Port 5) Direct drive of LED possible.	E	
P60 – P63	Input/Output	—	Programmable 4-bit input/output port (Port 6) Input/output settable in bit units. Built-in pull-down resistor (mask option). Optimum for key input.	V	
PH0	Output	T13	4-bit P-ch open. drain high voltage resistant high current output port (Port H). Direct drive of LED possible. Built-in pull-down resistor (mask option).	I	
PH1		T12			
PH2		T11			
PH3		T10			

- Function of Other Pins

Pin	Input/Output	Pin with which used	Function	Type of Input/Output Circuit
T0 – T9	Output	—	High voltage resistant high current output pin for digit output.  FIP controller/driver output pins. Bit units built-in pull-down resistor (mask option)	I
T10 – T13		PH3 – PH0		
T14 / S11 T15 / S10		—		
S9		—		
S0 – S8		—		
PPO	Output	—	Time/pulse generator pulse output pin.	D
T10	Input	P13	External event pulse input to timer/event counter.	B
SCK	Input/Output	P01	Serial clock input/output pin.	F
SO	Input/Output	P02	Serial data output pin or serial data input pin.	G
SI	Input	P03	Serial data input pin, or normal input pin.	B
INT4	Input	P00	Edge detection vector interrupt input pin. (detection of either leading or trailing edge)	B
INT0	Input	P00	Edge detection vector interrupt input pin w/ noise reduction. (detected edge settable)	B
INT1		P11		
INT2	Input	P12	Edge detection testable input pin. (detection of leading edge)	B
BUZ	Input/Output	P23	Fixed frequency output pin. (for buzzer or system clock trimming)	E
X1, X2		—	Crystal/ceramic connection pin for main system clock generation. For external clock, input to X1, X2 open.	
XT1, XT2		—	Crystal connection pin for subsystem clock generation. For external clock, input to XT1, XT2 open.	
RESET	Input	—	System reset input pin. (low level active)	B
V <sub>PRE</sub>		—	FIP controller/driver output buffer power supply pin.	I
V <sub>LOAD</sub>		—	FIP controller/driver pull-down resistor connection pin.	I
V <sub>DD</sub>		—	Regular power source pin.	
V <sub>SS</sub>		—	GND potential pin.	

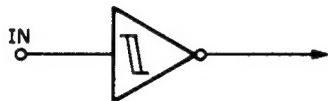
● Pin Input/Output Circuits

TYPE A



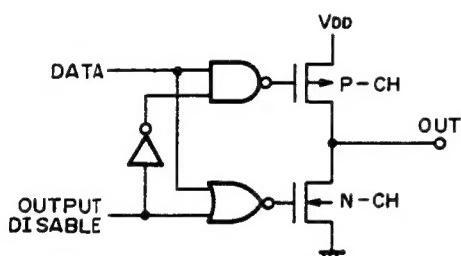
Input buffer conforming to CMOS standards.

TYPE B



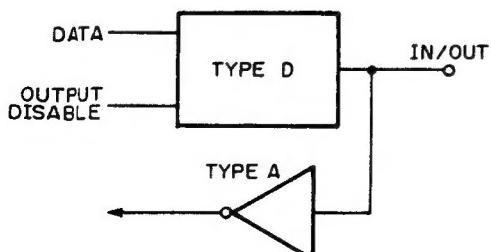
Schmitt trigger input with hysteresis.

TYPE D



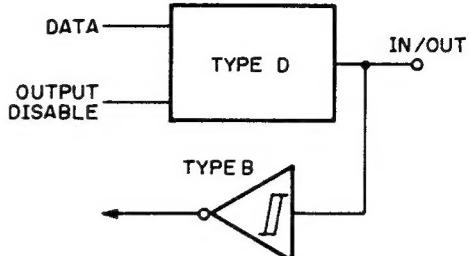
Pushable output in which output can be given high impedance (both P-ch and N-ch off).

TYPE E



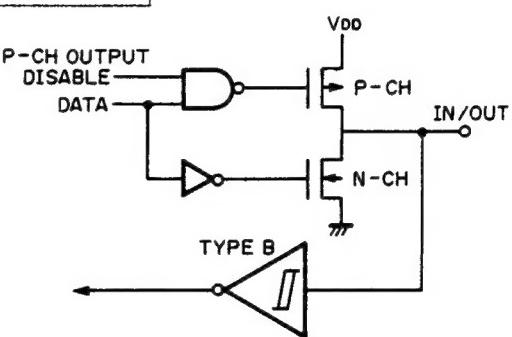
Input/output circuit consisting of Type D pushable output and Type A input buffer.

TYPE F



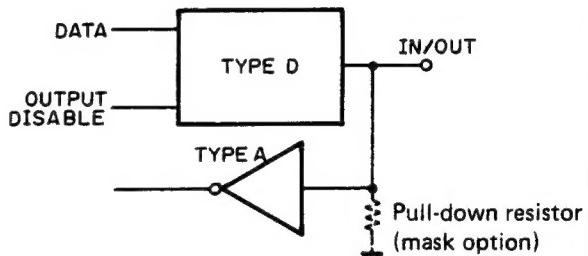
Input/output circuit consisting of Type D pushable output and Type B Schmitt trigger input.

TYPE G

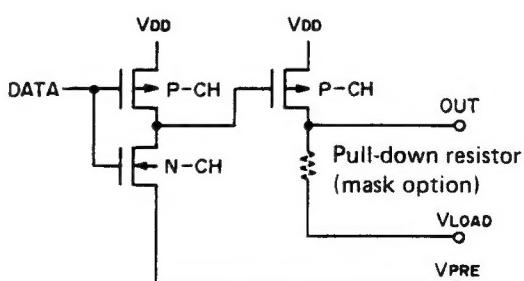


Input/output circuit which can be switched between pushable output and N-ch open drain output (P-ch off).

TYPE V



TYPE I



## 2. Distribution of Voltage for Circuit Diagrams

Excluding the main amplifier, the voltages of the ICs and transistors for the various circuits differ totally depending on the function, mode and what has been selected by the microprocessor. The following shows the voltages of the various parts on matrices or diagrams.

The following matrix shows the base voltage for main amplifier muting circuit transistors QN51 – QN54, QN56, and QN58.

Operation	QN51 QN52 QN58	QN53 QN54	QN56
Normal operation	-36.5V	-2.2V	-2.2V
When function/mode switched (100 ms pulse)	-36.5V	0.6V	0.6V
When power turned off (until power relay turns off)	-36.5V	0.6V	0.6V
When Dolby calibration switch on	-36.5V	0.6V	-2.2V
When mute switch on	0.6V	-2.2V	-2.2V
After monitor operation	-36.5V	-2.2V	0.6V

NOTE: When the voltage is 0.6 V, the transistor is on.

If the mute switch is on during the after monitor operation, the base of QN51, QN52, and QN58 is of course 0.6 V.

## Voltage of Selector Board (PS04) Parts

### • QS01

The voltage of pins 10 – 15, 17, 20, and differs according to the position of the DIRECT REC selector on the direct front pocket. The positions of the switch and the IC pin voltage is shown on the following matrix. For pins 20 and 21, the operation is shown on the diagram following. The normal voltage is 0 V.

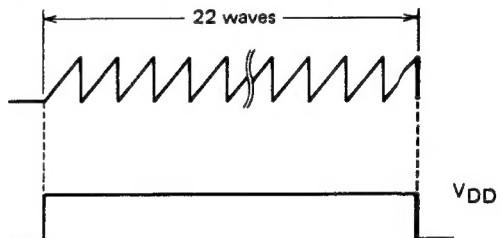
Selector Position	QS01 Pin No.					
	11	12	13	14	15	10/17
SOURCE	H	H	H	H	H	L
PHONO	L	H	H	H	H	H
TUNER	H	L	H	H	H	H
CD	H	H	L	H	H	H
LV	H	H	H	L	H	H
VCR-1	H	H	H	H	L	H

For H, the voltage should be in the range 16 – 15 volts, 0 to +1.0 V. If no sound is produced from the source when pins 10 and 17 are low, set the capacity of CS41 on the PS84 board to 47μF.

Pins 20 and 21 operate as shown below.

When any of pins 11 – 15 or 17 are switched to low:

Pin 20—22 waves generated, then stops.



Pin 21 becomes high (same as power source voltage) only while the above 22 waves are being generated.

### • QS02

The voltage of pins 11 – 15 differs according to the function selected. Pins 20 and 21 operate in the same way as for QS01.

Selected Function	QS02 Pin No.				
	11	12	13	14	15
TUNER (F specifications only)	L	H	H	H	H
AM/FM (A, E, N, T, W specifications)	L	H	H	H	H
CD	H	H	L	H	H
PHONO	H	L	H	H	H
LV	H	H	H	L	H
TV (F specifications only)	L	H	H	H	H
TV (A, E, N, T, W specifications)	H	H	H	H	L
Others (TAPE, VCR-1, VCR-2)	*	*	*	*	*

\* indicates that the voltage directly before the function selected is held. Thus, if VCR-1 is selected after CD, pin 13 is low, the others are high.

### • QS03, QS04, and QS05

The voltage of the QS03 – QS05 control pins (5, 6, 12, and 13) differ according to the selected function, as follows:

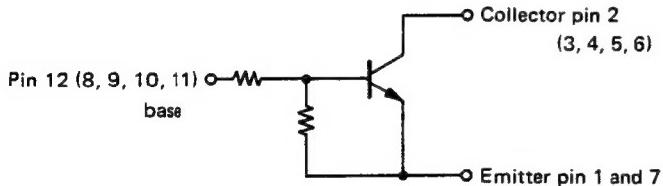
Selected Function	QS03		QS04				QS05	
	5, 6	12, 13	5	6	12	13	5, 6	12, 13
TAPE	L	L	L	H	H	L	H	H
VCR-1	H	L	H	L	L	H	L	H
VCR-2	L	H	H	L	L	H	H	L
After Monitor TAPE	L	L	H	H	H	H	H	H
After Monitor VCR-1	H	L	H	L	L	H	*	H
After Monitor VCR-2	L	H	H	L	L	H	H	H
Others	L	L	H	L	L	H	H	H

\*: Low when the DIRECT REC SELECTOR is at the VCR-1 position, otherwise high.

H = +13 – 16 V, L = -16 – -13 V.

### • QS06, QS11, QS13 and QS12, QS14

This is a 5-element transistor array, consisting of an NPN (QS06, QS11, and QS13) and PNP (QS12 and QS14) transistors. The circuit is shown below. Pins 1 and 7 are common pins (emitter) and are connected internally.



The output is low 0 V (QS06) – 16 V (QS12, QS14) depending on the QS07 signal.

Elements A and B in the QS08 constitute a set-reset flip-flop. A W signal enters B pins 1 and 2 from the microprocessor board (PU04) only during after-monitoring, pin 9 becomes low (0 V), pin 6 becomes high (5 V), voltage shift (+16 V) is performed between QS11 pins 11 – 2 and QS12 pins 11 – 2, and QG07 pins 5 and 6 become high (16 V).

Element C operates in the same way when the TAPE, VCR-1, or VCR-2 function is selected (including after monitoring), making QG06 pins 5 and 6 low (-16 V) and switching the monitor section and source section on the input side.

QS15 – QS18, QS24, and QG08 generate the inverted signals of the various signals.

### • QS07

QS07 is an IC for expanding the microprocessor ports. One of pins 5 – 9 and one of pins 10, 12 – 20 emit a high signal depending on the command from the microprocessor. The relationship between the selected modes or functions and the voltage of the pins is shown below.

Selected Mode	QS07 Pin No.				
	5	6	7	8	9
Dolby	L	L	L	L	H
Matrix	L	L	L	H	L
Spacial	L	L	H	L	L
Stereo	L	H	L	L	L
Mono	H	L	L	L	L

Selected Function	QS07 Pin No.									
	10	13	14	15	17	18	19	20		
TUNER (AM/FM)	L	L	L	L	L	L	L	H		
PHONO	L	L	L	L	L	L	H	L		
CD	L	L	L	L	L	H	L	L		
TAPE	L	L	L	L	H	L	L	L		
LV	L	L	L	H	L	L	L	L		
TV	L	L	H	L	L	L	L	L		
VCR-1	L	H	L	L	L	L	L	L		
VCR-2	H	L	L	L	L	L	L	L		

Initially Dolby and TUNER (or FM) are selected, so pins 5 and 20 are high.

• PL04 (VIDEO AMP)

Status	QL05 base	QL05 collector and QL04 Pin 12	QL06 base	QL06 collector and QL14 Pin 13	QL07 base	QL07 collector and QL14 Pin 14	QL08 base	QL08 collector and QL14 Pin 15	QL14 Pin 5	QL09 base	QL09 collector and QL01 Pin 6	QL14 Pin 4	QL10 base	QL10 collector and QL01 Pin 5	QL14 Pin 3	QL11 base	QL11 collector and QL01 Pin 12	QL14 Pin 2	QL12 base	QL12 collector and QL01 Pin 13
Function - TV	0	6.8	0.6	0	0	6.8	0	6.8	6.8	6.8	-6.8	0	6.2	6.8	6.8	-6.8	6.8	6.8	-6.8	
Function - LV	0	6.8	0	6.8	0	6.8	0.6	0	6.8	6.8	-6.8	6.8	6.8	-6.8	6.8	-6.8	0	6.2	6.8	
Function - VCR-1	0.6	0	0	6.8	0	6.8	0	6.8	0	6.2	6.8	6.8	6.8	-6.8	6.8	-6.8	6.8	6.8	-6.8	
Function - VCR-2	0	6.8	0	6.8	0.6	0	0	6.8	6.8	6.8	-6.8	6.8	6.8	-6.8	0	6.2	6.8	6.8	-6.8	
Function - other audio	0	6.8	0	6.8	0	6.8	0	6.8	6.8	6.8	-6.8 NOTE 3	6.8	6.8	-6.8 NOTE 3	6.8	6.8	-6.8 NOTE 3	6.8	6.8	-6.8 NOTE 3
Function - after monitor VCR-1	0.6	0	0	6.8	0	6.8	0	6.8	0	6.2	6.8	6.8	-6.8	6.8	-6.8	6.8	6.8	6.8	-6.8	
Function - after monitor VCR-2	0	6.8	0	6.8	0.6	0	0	6.8	6.8	6.8	-6.8	6.8	6.8	-6.8	0	6.2	6.8	6.8	-6.8	
Function - after monitor TAPE	0	6.8	0	6.8	0	6.8	0	6.8	6.8	6.8	-6.8 NOTE 3	6.8	6.8	-6.8 NOTE 3	6.8	6.8	-6.8 NOTE 3	6.8	6.8	-6.8 NOTE 3

- NOTES 1) 0 refers to a voltage of 0 V - 0.3 V, 6.8 V is the power source voltage.  
 2) -6.8 is the negative power source voltage. For both ±6.8, a discrepancy of 0.3 V can be tolerated.

3) QL14 has a latch function, so if an audio function is selected after a video function (TV, LV, VCR-1, or VCR-2), the circuits have stored the status for the previous selection. When checking video functions (including after monitor), always change only between video functions to avoid errors.

- 4) QL01 is an analog switch which switches the monitor output.  
 5) QL04 pin 9 only has a voltage of 6.8 V when one of QL14 pins 12 - 15 is 0. If there is no input, the voltage is 0.

Status	QL22 base	QL22 collector	QL23 base	QL23 collector and QL03 Pin 25	QL24 base	QL24 collector and QL02 Pin 5	QL25 base	QL25 collector	QL03 Pin 4	QL03 Pins 8 and 12	QL03 Pins 1, 10 and 13	QL03 Pins 6, 9, and 11	QL03 Pin 3 and QL02 Pin 12	QL02 Pin 6	QL02 Pin 13	
DIRECT REC SELECTOR - LV	0.6	0	6.2	6.8	9.3	-6.8	6.2	6.8	-6.8	*	*	*	*	-6.8	6.8	6.8
DIRECT REC SELECTOR - VCR-1	0.6	0	6.2	6.8	6.2	6.8	9.3	-6.8	-6.8	*	*	*	*	-6.8	-6.8	-6.8
DIRECT REC SELECTOR - other than LV, VCR-1, and SOURCE	0.6	0	6.2	6.8	9.3	-6.8	9.3	-6.8	-6.8	*	*	*	*	-6.8	-6.8	-6.8
DIRECT REC SELECTOR - SOURCE, Function - video (TV or LV)	0	6.8	6.8	-6.8	9.3	-6.8	9.3	-6.8	**	**	**	**	**	6.8	**	
DIRECT REC SELECTOR - SOURCE, Function - VCR-1, VCR-2, and audio	0	6.8	6.8	-6.8	9.3	-6.8	9.3	-6.8	***	***	***	***	***	6.8	***	

NOTES \* If the TV function is selected, QL03 pins 8, 6, 9, and 11 have a voltage of 6.8 V, and pins 1, 10, and 13 have a voltage of -6.8 V. If LV is selected, this is reversed, and there is no output, so ignore.

\*\* When TV is selected, QL03 pins 8, 3, 6, 9, and 11 have a voltage of 6.8 V, pins 1, 4, 10, 12, and 13 a voltage of -6.8 V. For LV, this is reversed.

\*\*\* Voltages are that of the previously selected function (either TV or LV). For the voltage distribution, refer to note \*\* above.

3. PL14 P.W. Board

	QL26 Base Collector	QL27 Base Collector	
(1) When function LV, VCR-1, or VCR-2 is selected:	0.6	0	14.4 15
(2) When other functions are selected:	0	15	15 0

Normal pulse only when remote control signal is input.



The voltage of the collector depends on the connected euro-connector (21-pin).

Open (0 V) when no euro-connector is connected.

4. P604 P.W. Board

• Dolby (P604) Board Semi-conductor Voltage Matrix

	QS51				QS52			QS53			QS54		
Selected Mode	5	6	12	13	5	6, 12	13	Base	Coll.	Base	Coll.	Base	Coll.
Dolby	L	L	H	L	L	L	H	H -0.6V	H	L +0.6V	L		
Matrix	L	H	L	H	L	L	H	H -0.6V	H	L +0.6V	L		
Spacial	H	H	L	L	H	L	L	H	L	L +0.6V	L		
Stereo	L	L	L	L	L	H	H	H -0.6V	H	L	H		
Mono	H	L	L	L	H	H	H	H -0.6V	H	L	H		

NOTE: H refers to a + power source voltage within the range of 16 V to 13 V.

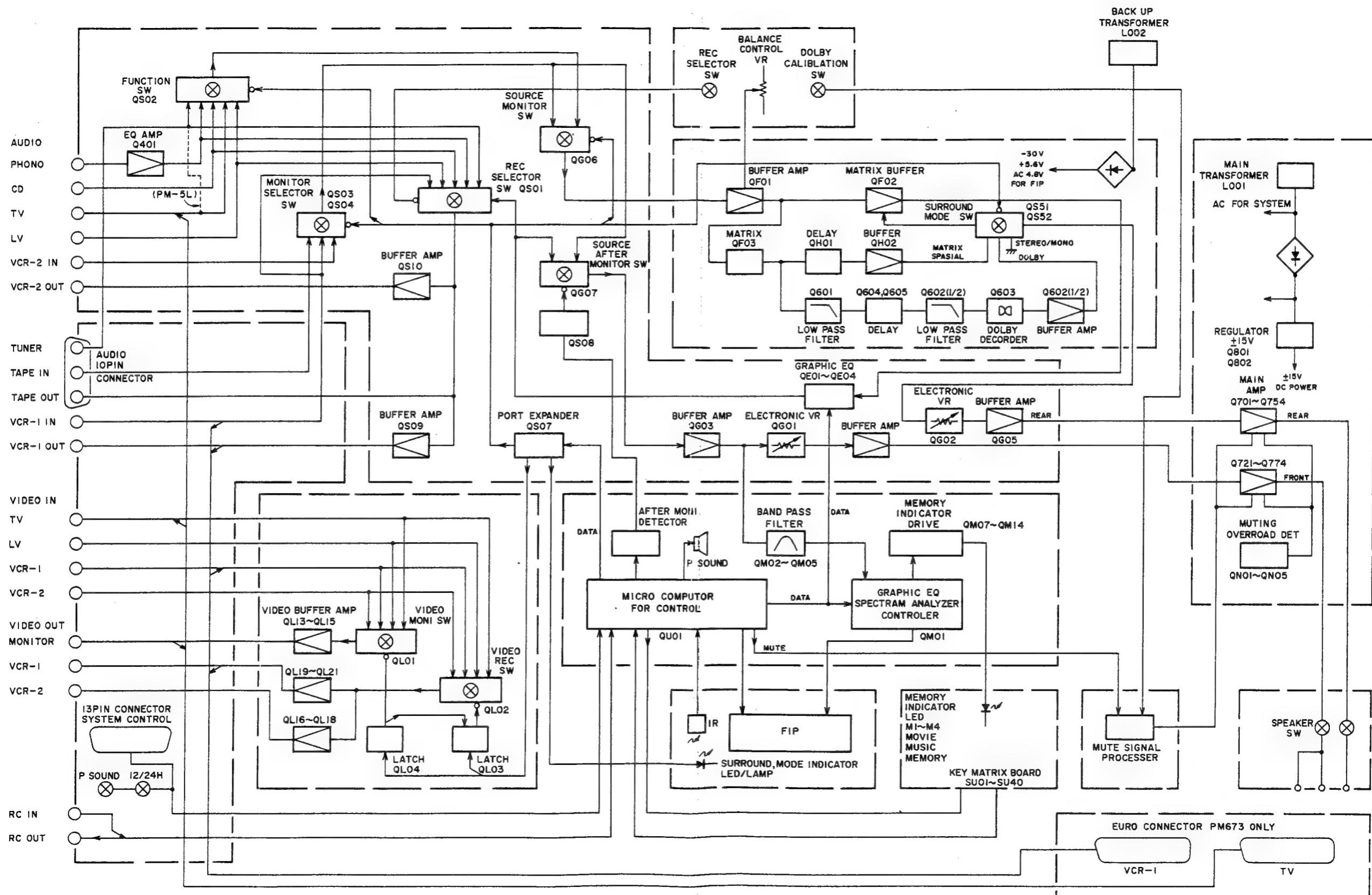
L refers to a - power source voltage within the range of -16 V to -13 V.

Discrepancies in the voltage are due to voltage drop in the diodes and transistor in the circuit.

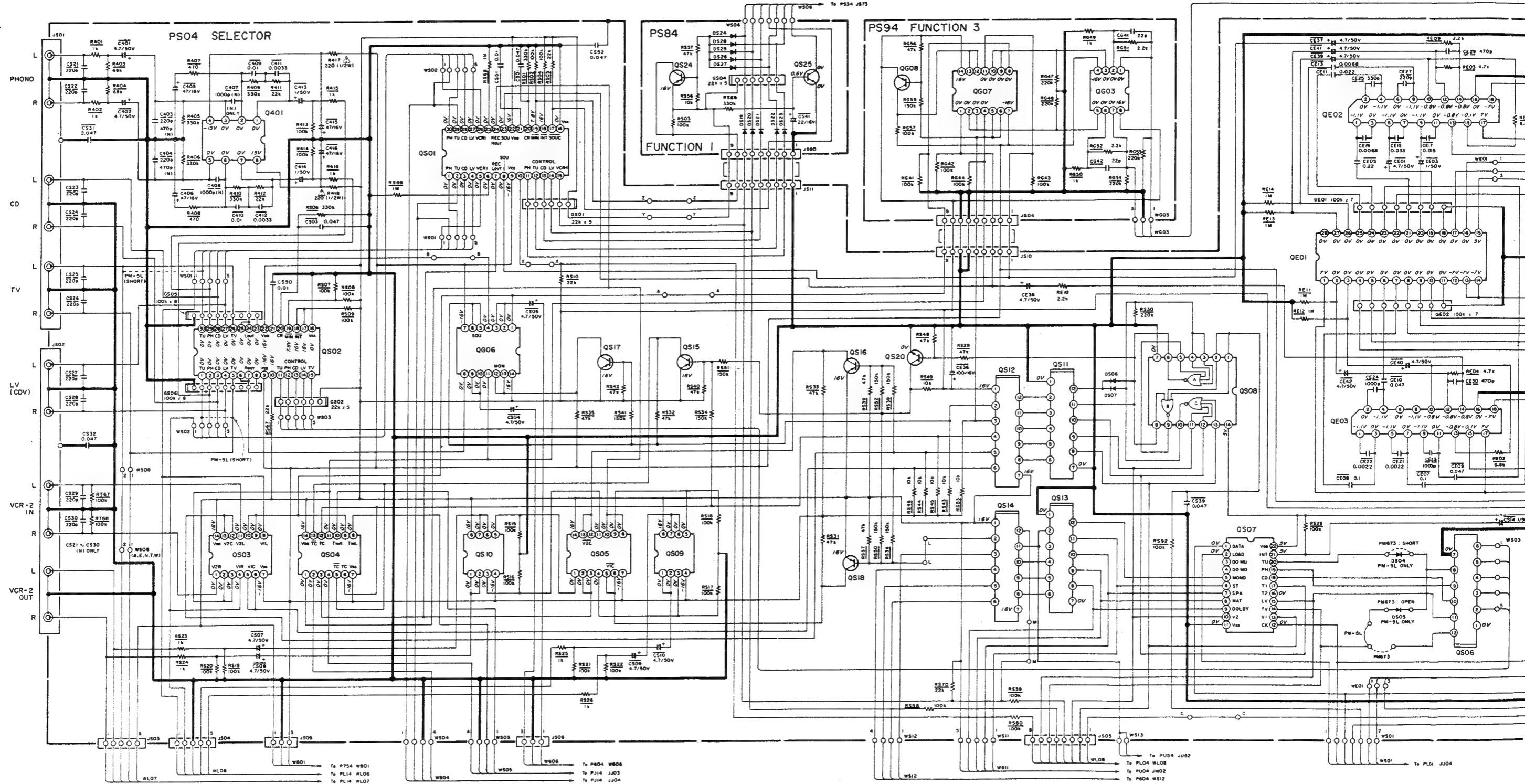
Discrepancies of the power source voltage × 0.7 can be tolerated for the above QS51 and QS52 pins, for both high and low.

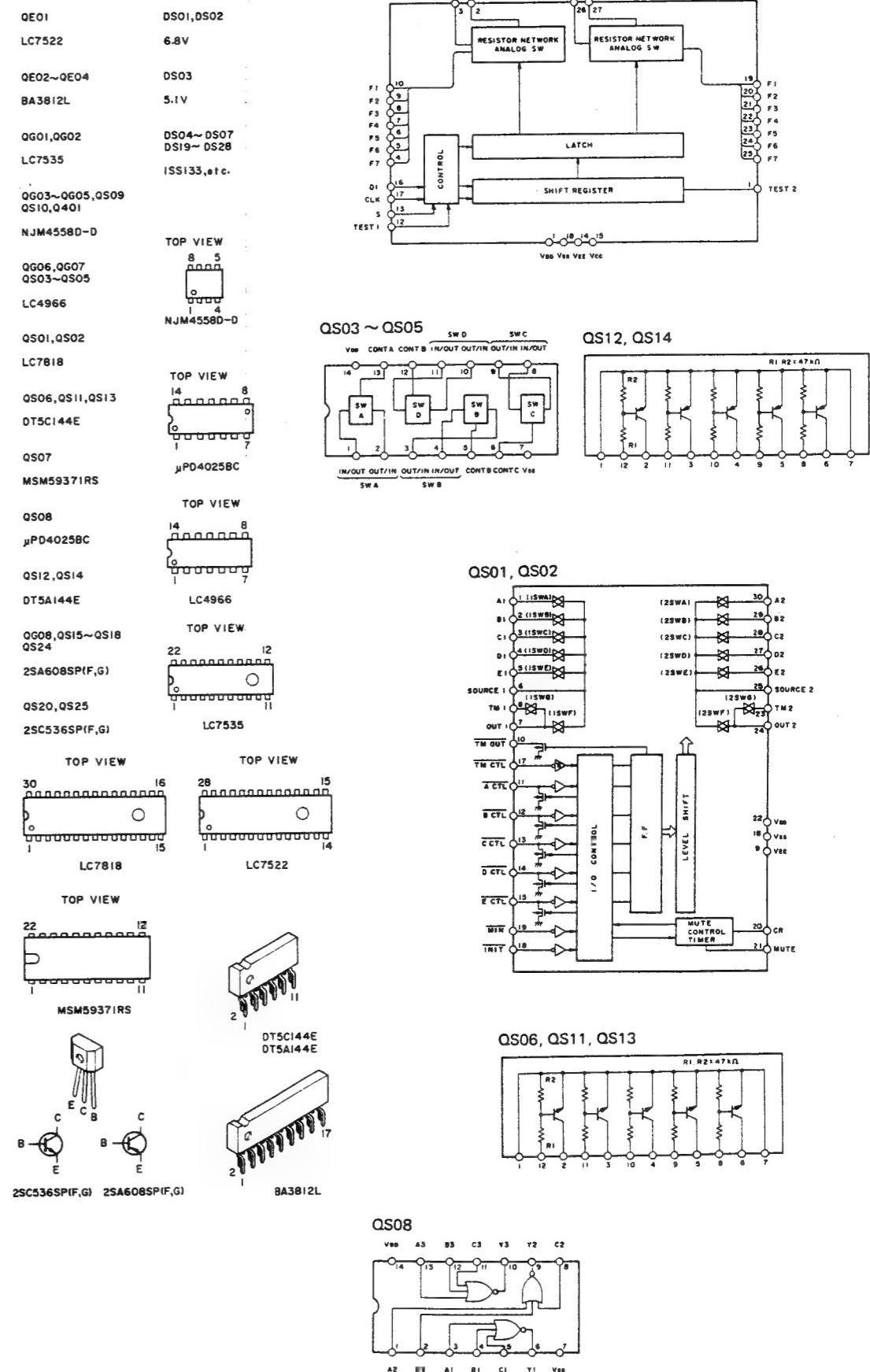
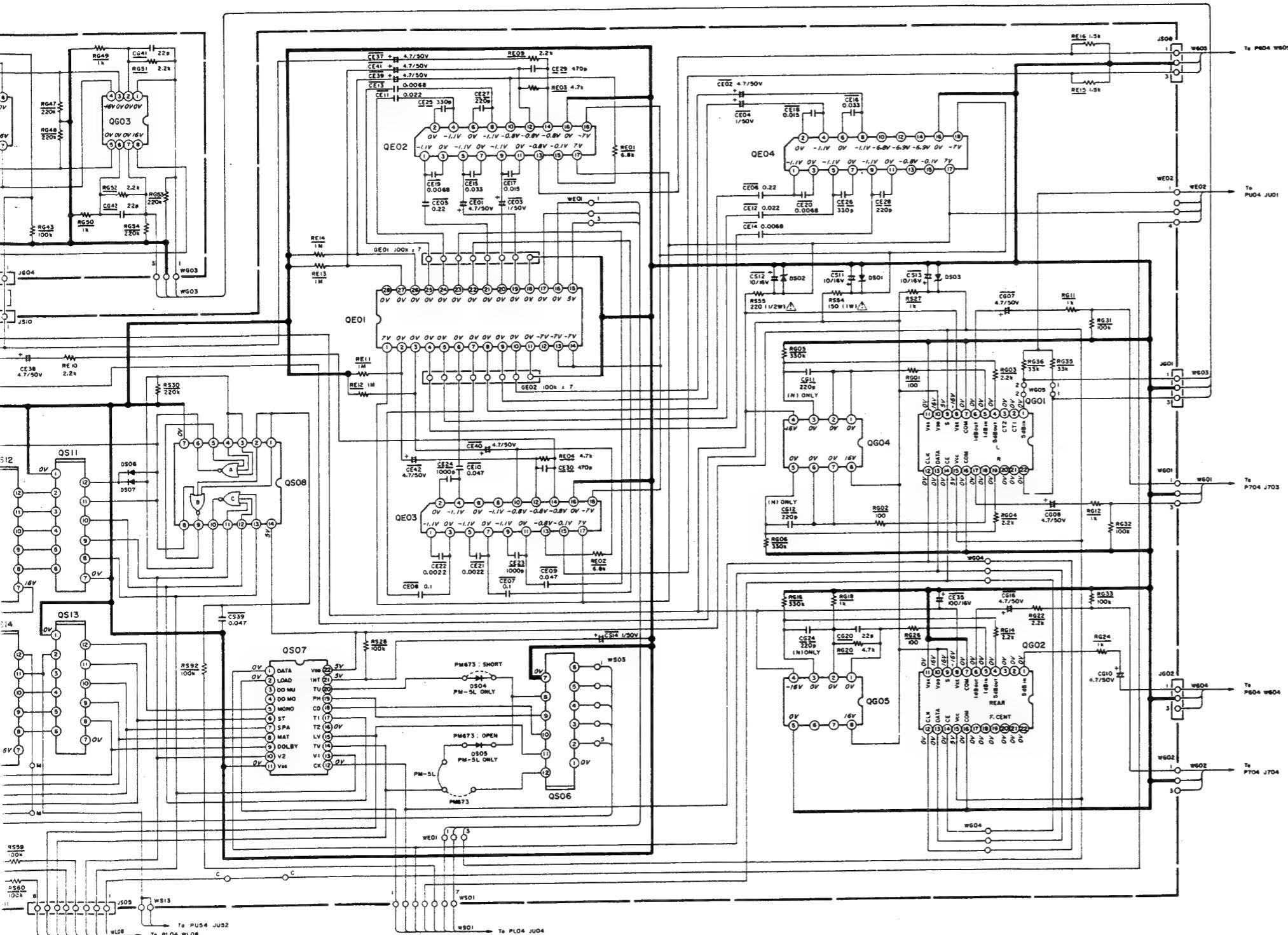
The input/output voltage of operational amplifier NTM4558 is shown as 0 V. However, there are variations as potential for voltages of 0 V to ±100 mV due to input drift of the various OP amps, but this can be ignored.

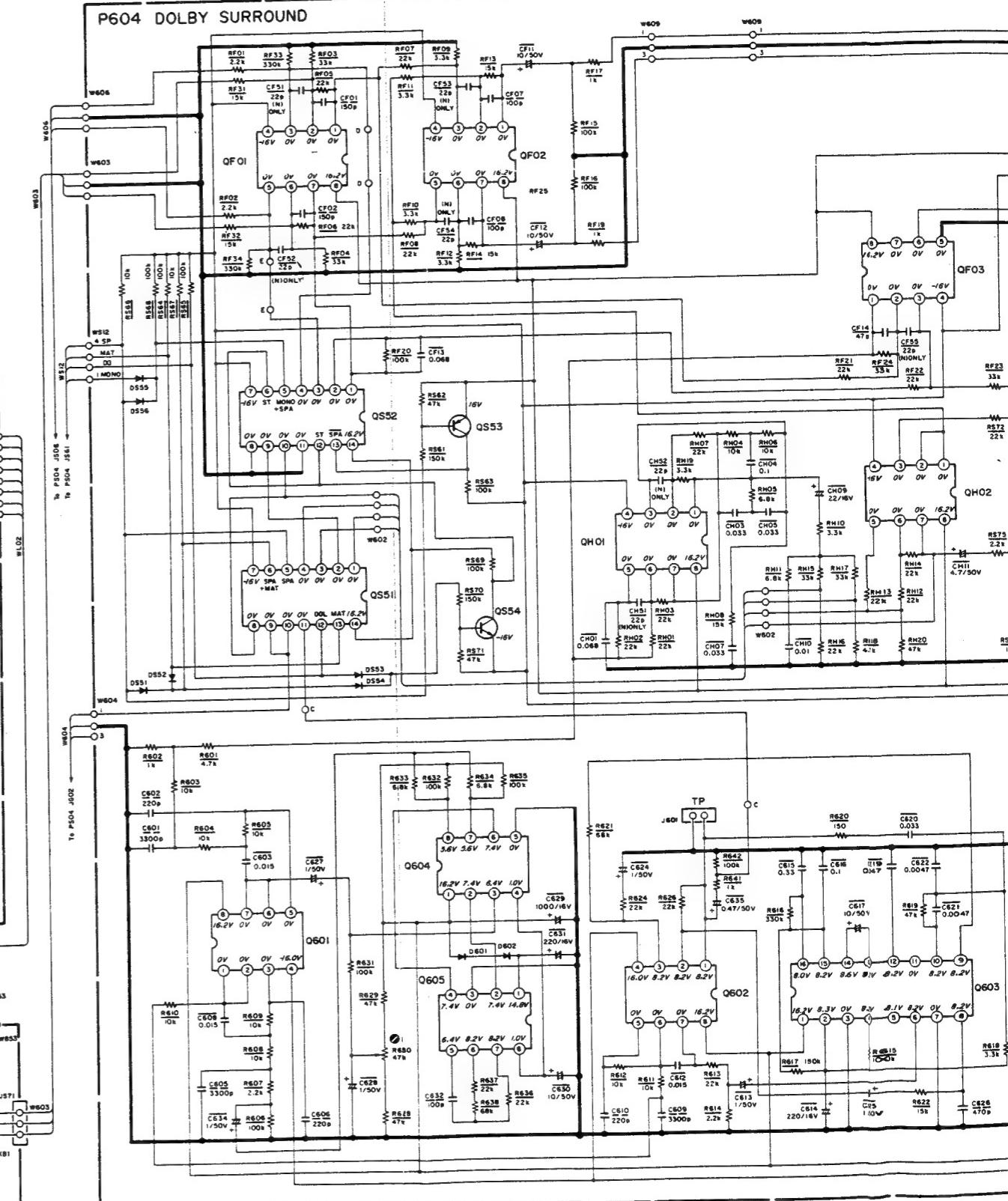
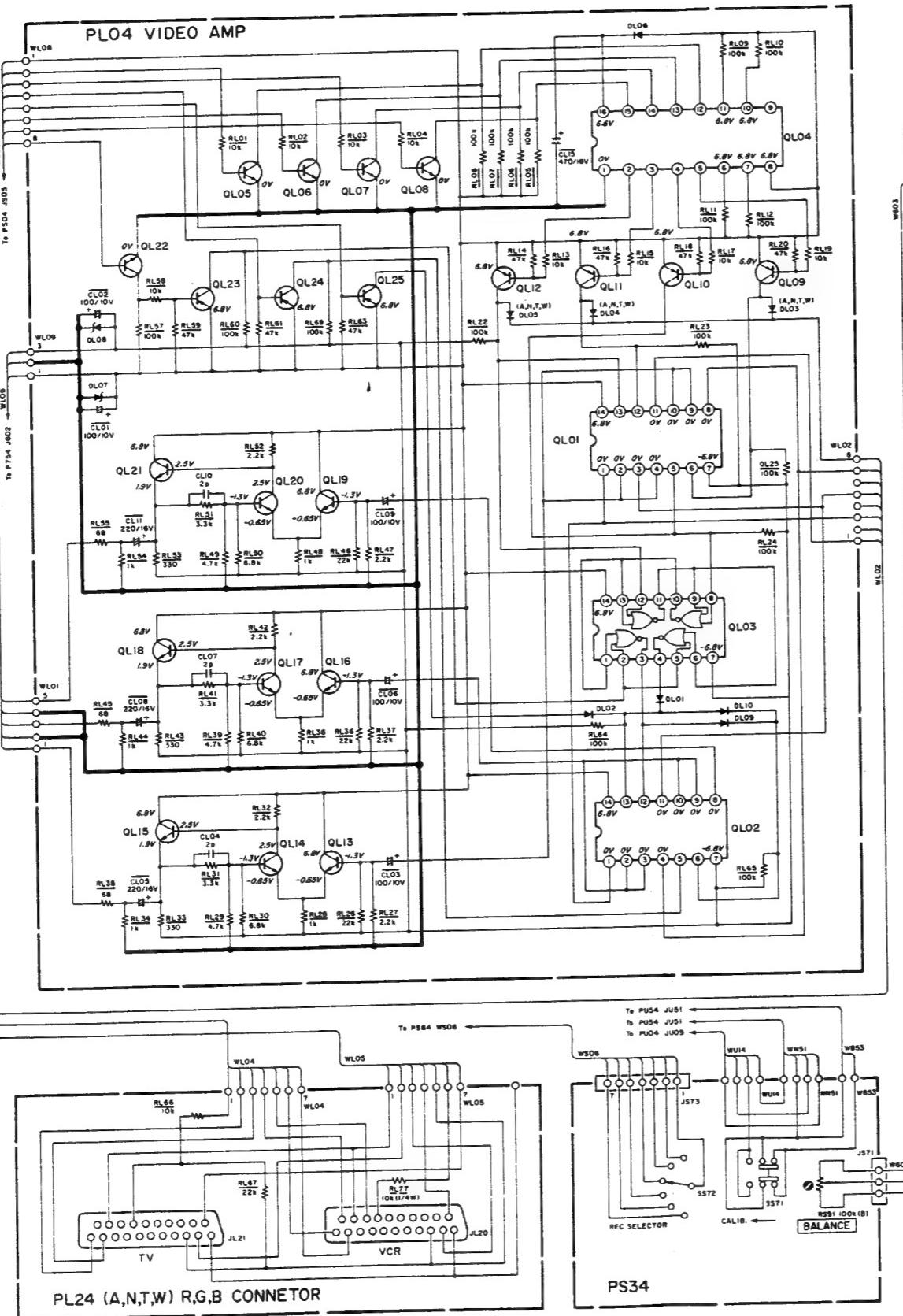
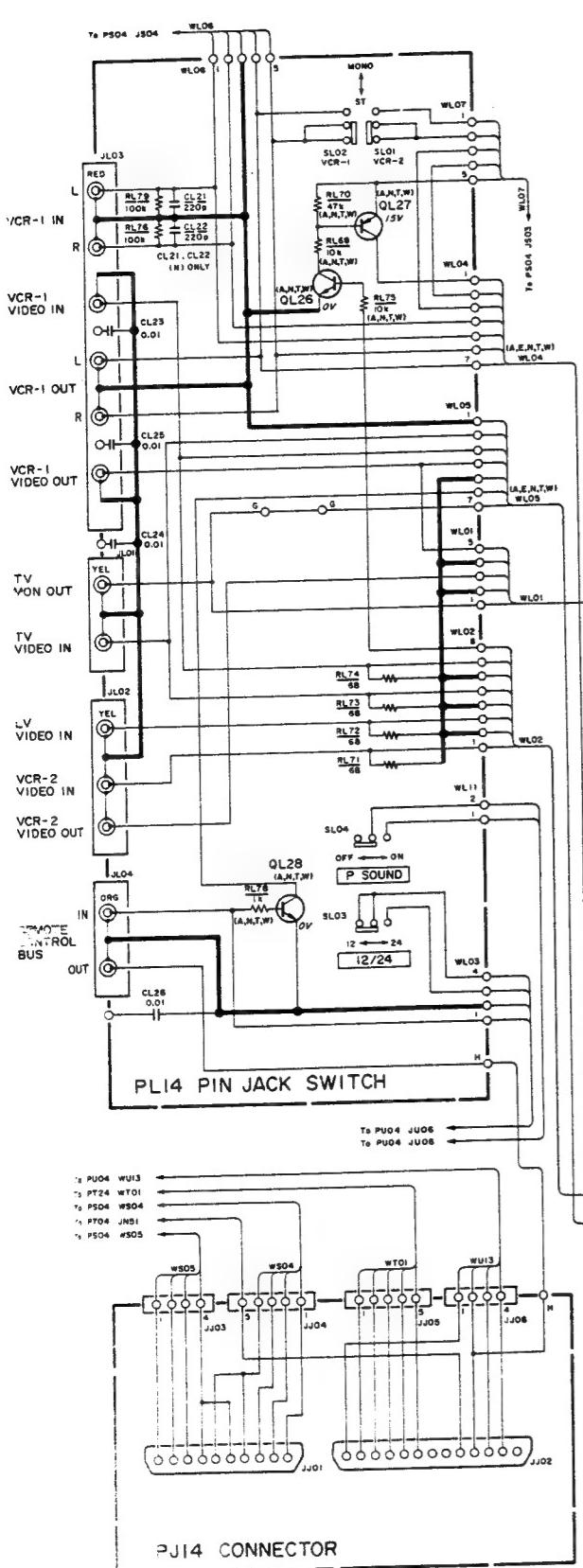
## 5. BLOCK DIAGRAM



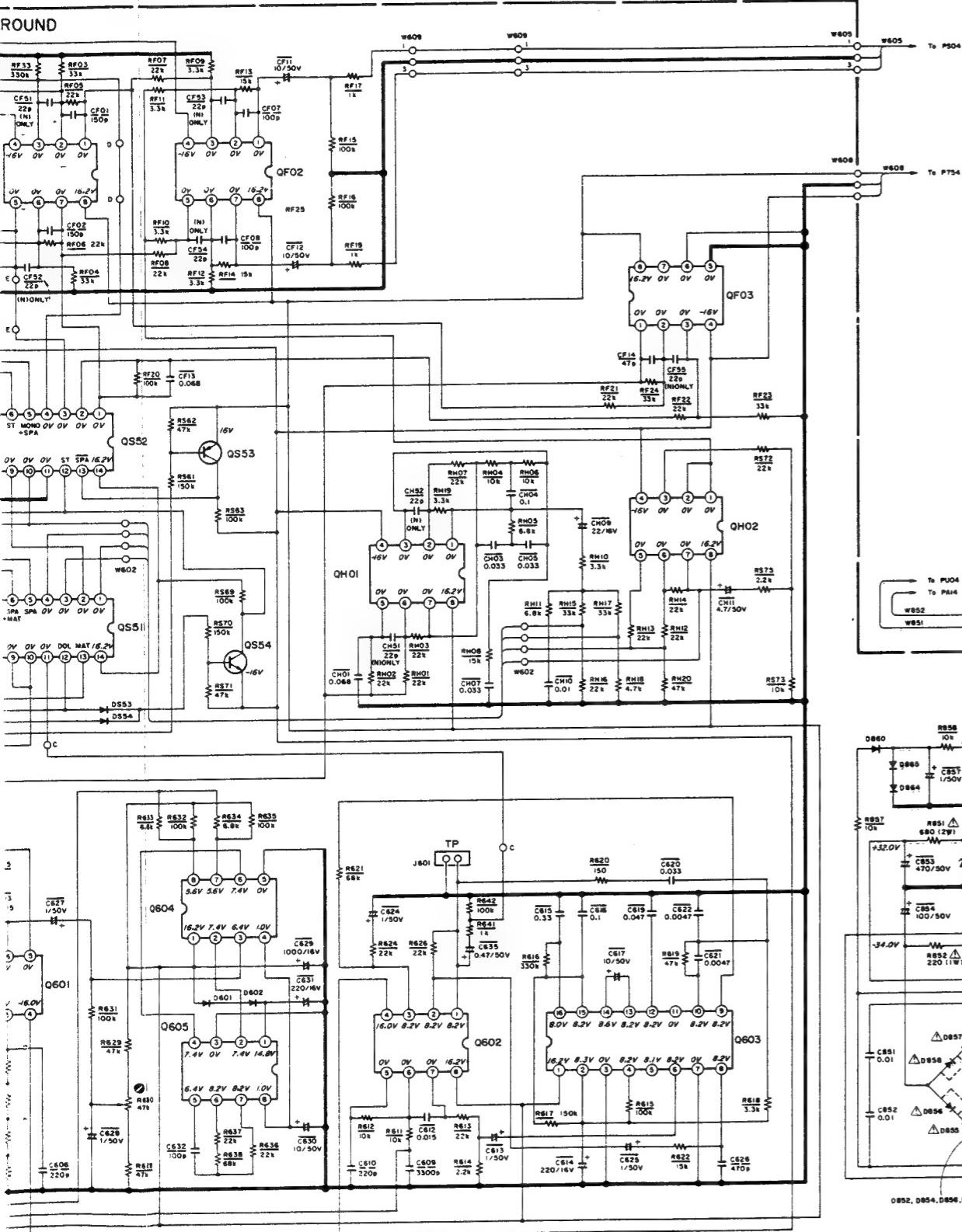
## 6. SCHEMATIC DIAGRAM







ROUND



Q601, Q602, QF01~QF03  
QH01, QH02  
NJM4558D

D601, D602, D864, D865  
D867, DLO1~DLO6, DLO9  
DL10, DS51~DS56

ISS133, etc.

Q603  
TA7629P

Q604  
MN3007

Q605  
MN3101

Q606  
5.6V

Q607  
12V

Q608  
6.8V

Q853, QL05~QL08, QL28  
QL13~QL22, QL26, QS54

2SC536SP(F,G)

Q854, QL09~QL12  
QL23~QL25, QL27, QS53

2SA608SP(F,G)

QL01, QL02  
LC4066

QL03  
LC4001

QL04  
TC9135P

QS51, QS52  
LC4966

TOP VIEW

8 5  
----  
1 4

NJM4558D

TOP VIEW

8 5  
----  
1 4

LC4001

TOP VIEW

6/3  
----  
1N-5  
1N-6

DITTO

TOP VIEW

8 5  
----  
1 4

LC4966

TOP VIEW

8 5  
----  
1 4

LC4066

TOP VIEW

2SC536SP(F,G) 2SA608SP(F,G)

TOP VIEW

14 8  
----  
1 7

LC4966

TOP VIEW

14 8  
----  
1 7

LC4001 LC4066

TOP VIEW

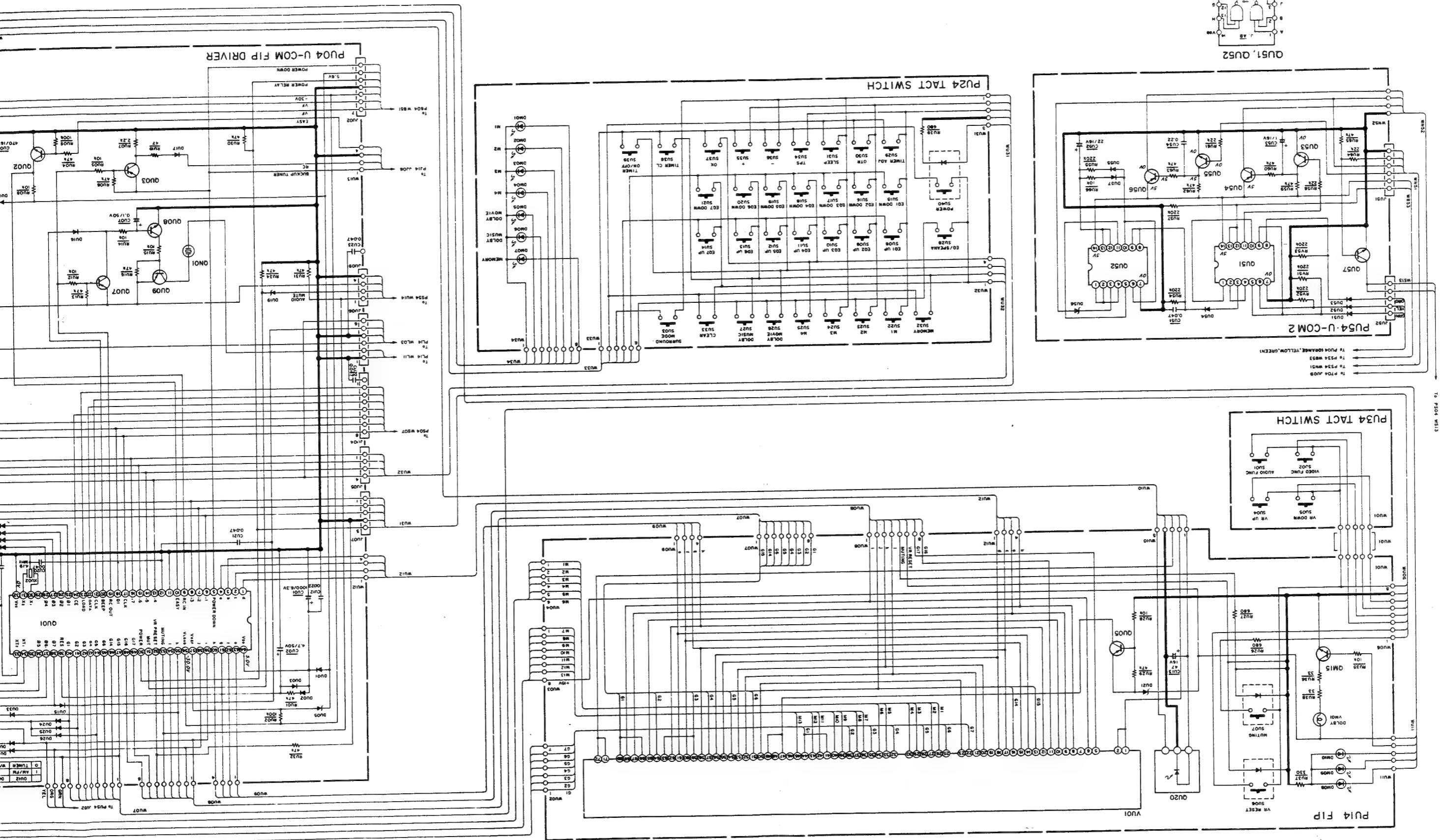
16 9  
----  
1 8

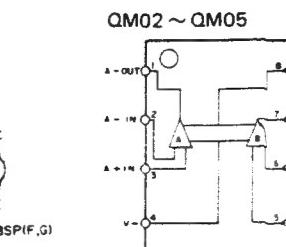
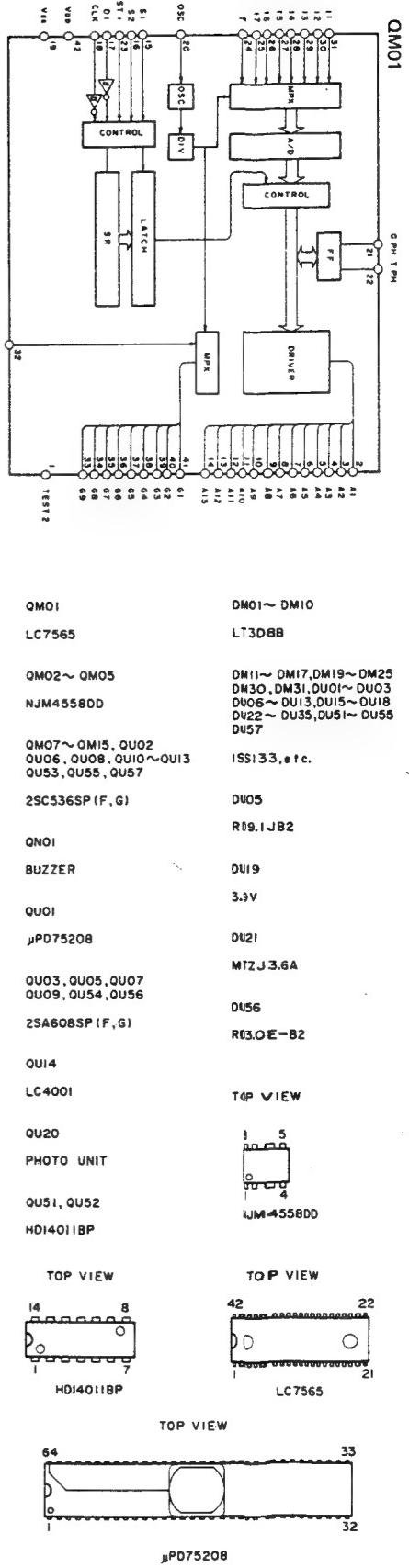
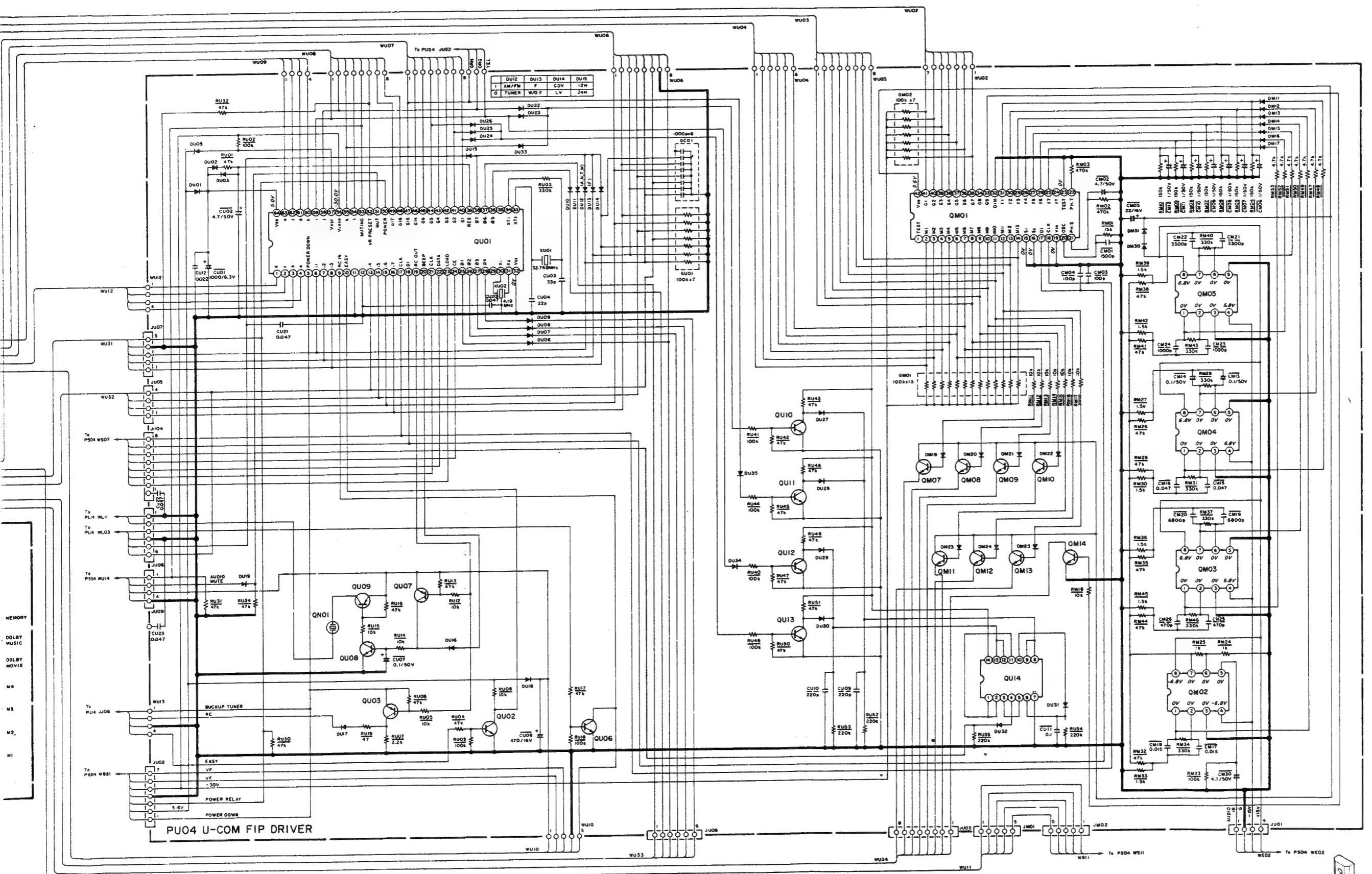
TA7629P TA9135P

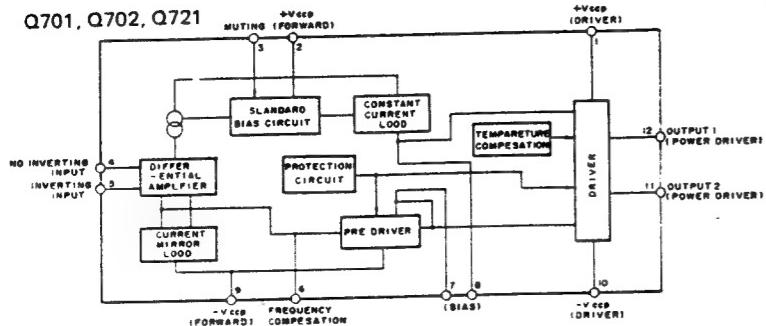
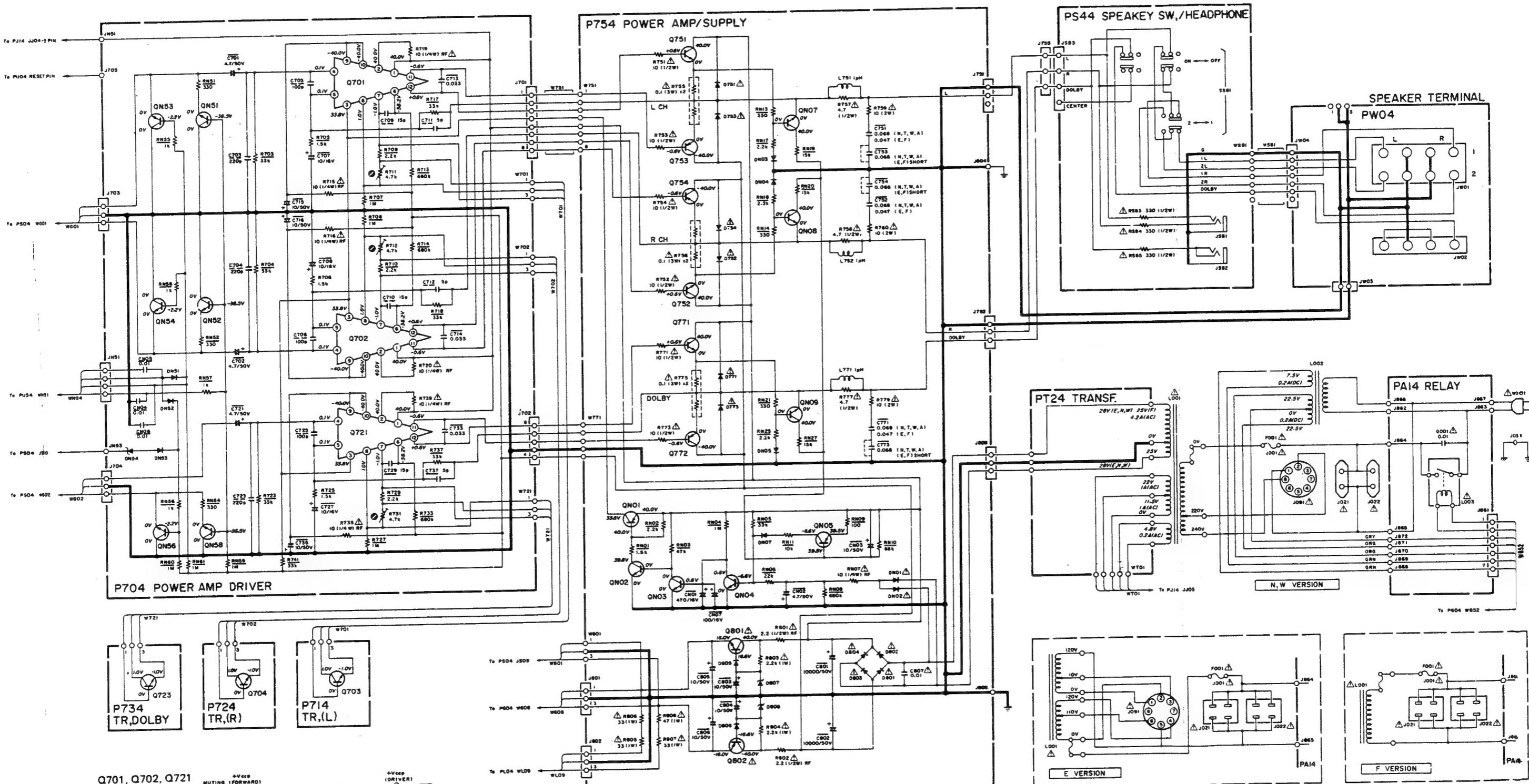
TOP VIEW

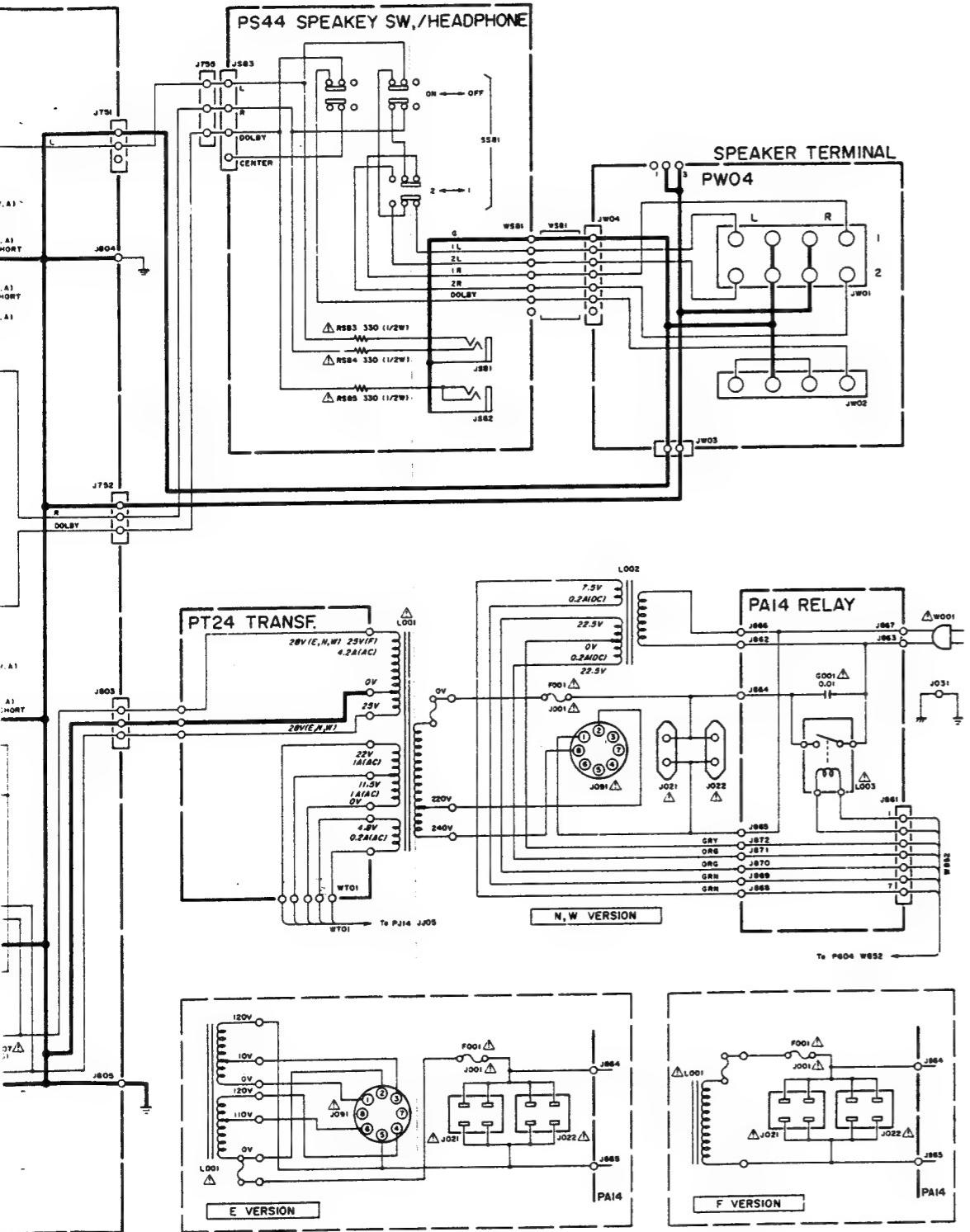
16 9  
----  
1 8

2SC2458(Y,GR)

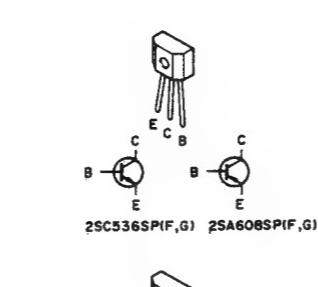








0701,0702,0721	0751~0754,0771
$\mu$ PCI270H	D773,DN01,DN02
DSFI0C,etc.	
0703,0704,0723	D801~D804
2SC3419(Y)	S3V20
0751,752,0771	D805,D806
2SD1714(S,P)	DN03~DN05, DN07
	DN51~DN53
0753,0754,0772	ISSI33,etc.
2SB1159(S,P)	D807,D808
Q801	16V
2SD1265(R,P)	DN54
Q802	12V
2SA1306(O,Y)	



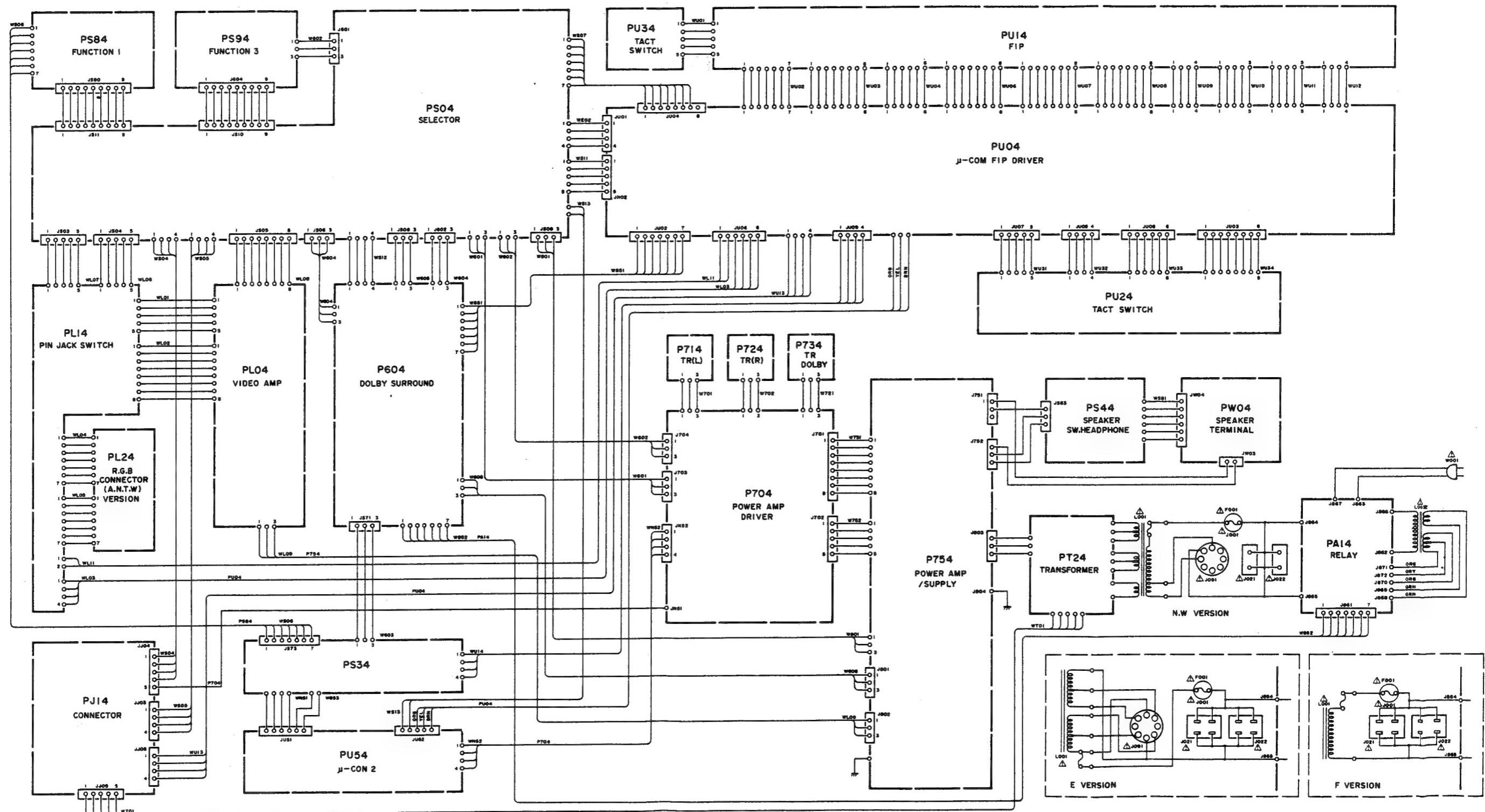
QNO1	2SA608SP(F,G)
QNO2,QNO7~QNO9	2SC2785(FF,EF)
QNO3,QNO4	2SC536SP(F,G)
QNO5	2SA1175(FF,EF)
QNO5~QNO54,QN56	QN58
QN58	2SC2878(A)

2SC536SP(F,G)	2SA608SP(F,G)
2SC2785(FF,EF)	2SA1175(FF,EF)
2SD1714(S,P)	2SB1159(S,P)

2SD1265(O,Y)	2SA1306(R,P)
--------------	--------------

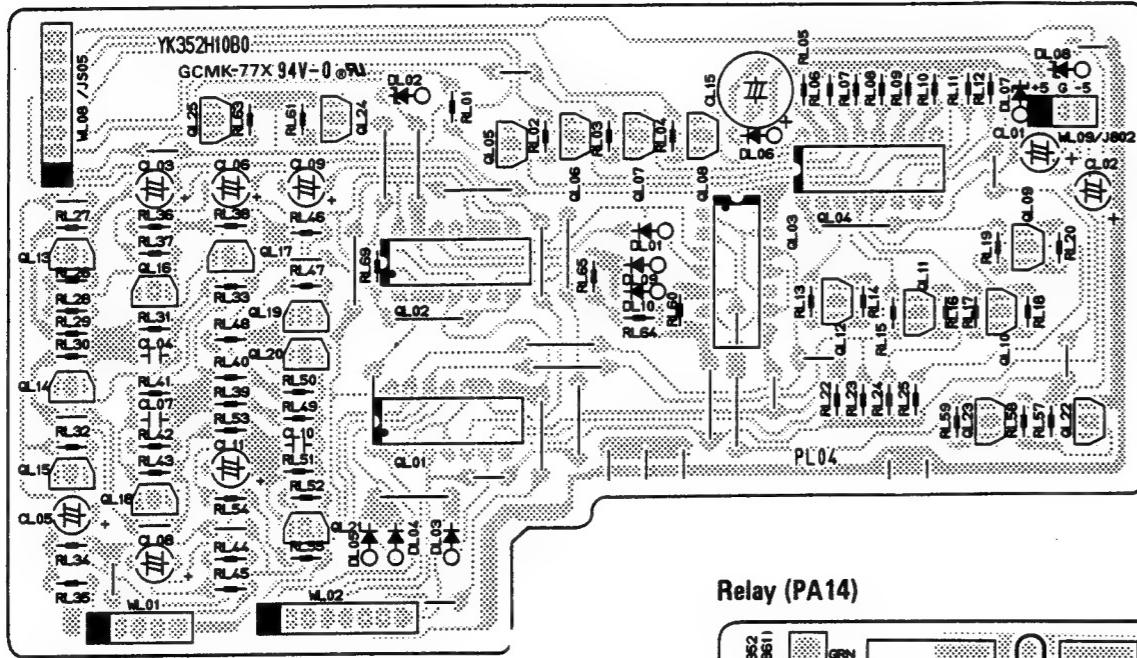
$\mu$ PCI270H
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## 7. WIRING DIAGRAM

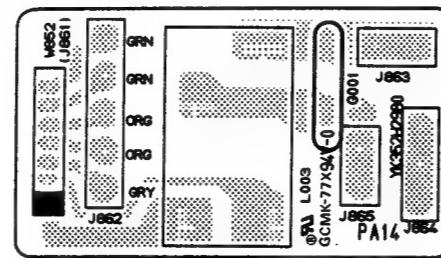


## 8. COMPONENT LOCATIONS

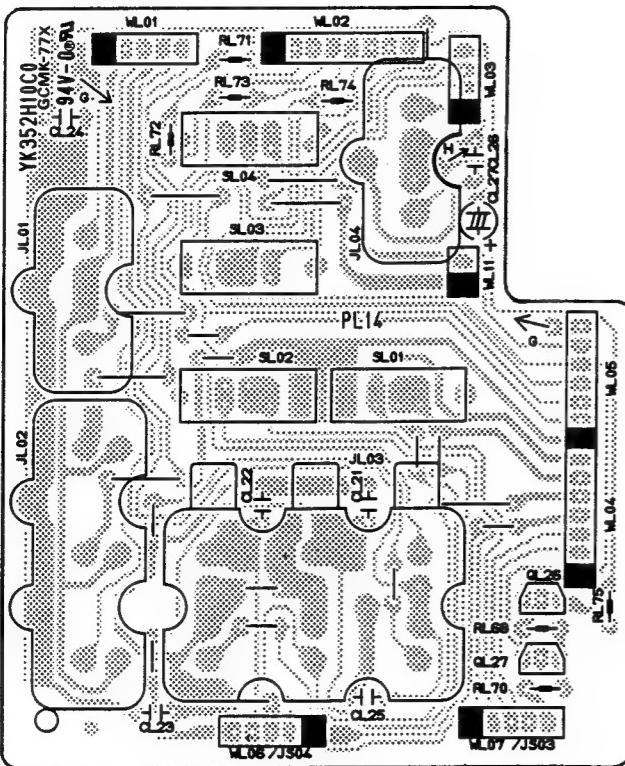
**Video Amp. (PL04)**



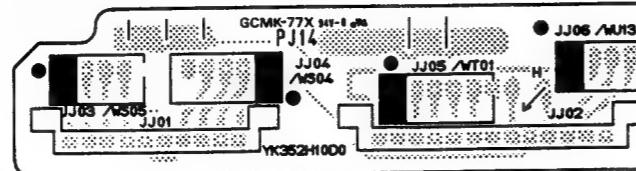
**Relay (PA14)**



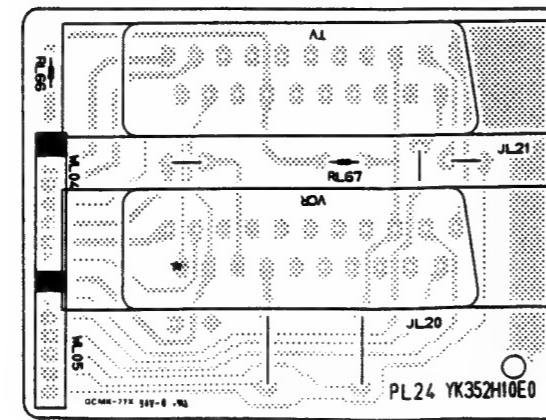
**Pin Jack Switch (PL14)**



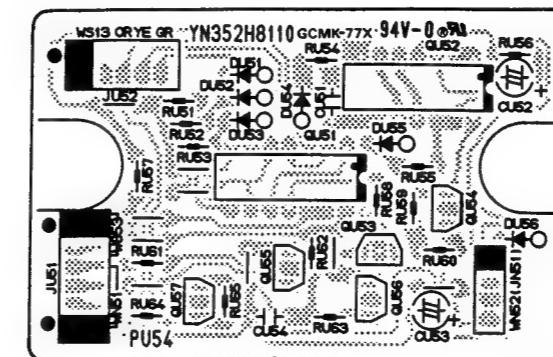
**Connector (PJ14)**



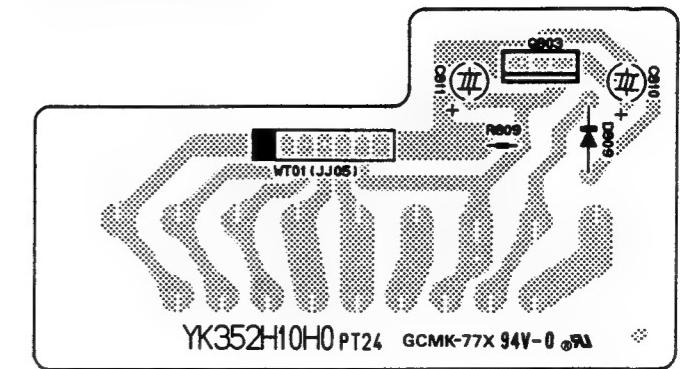
**R. G. B. Connector (PL24)**



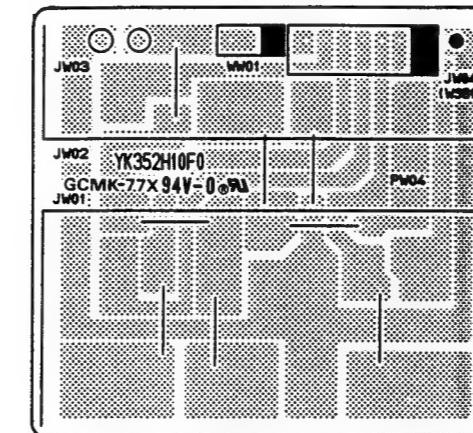
**U-COM 2 (PU54)**



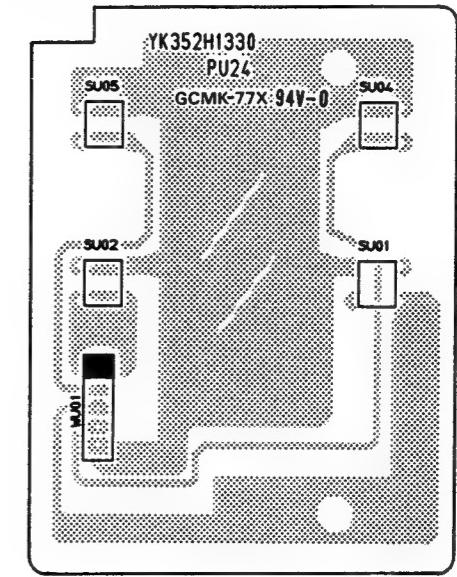
**Transf. Wire (PT24)**



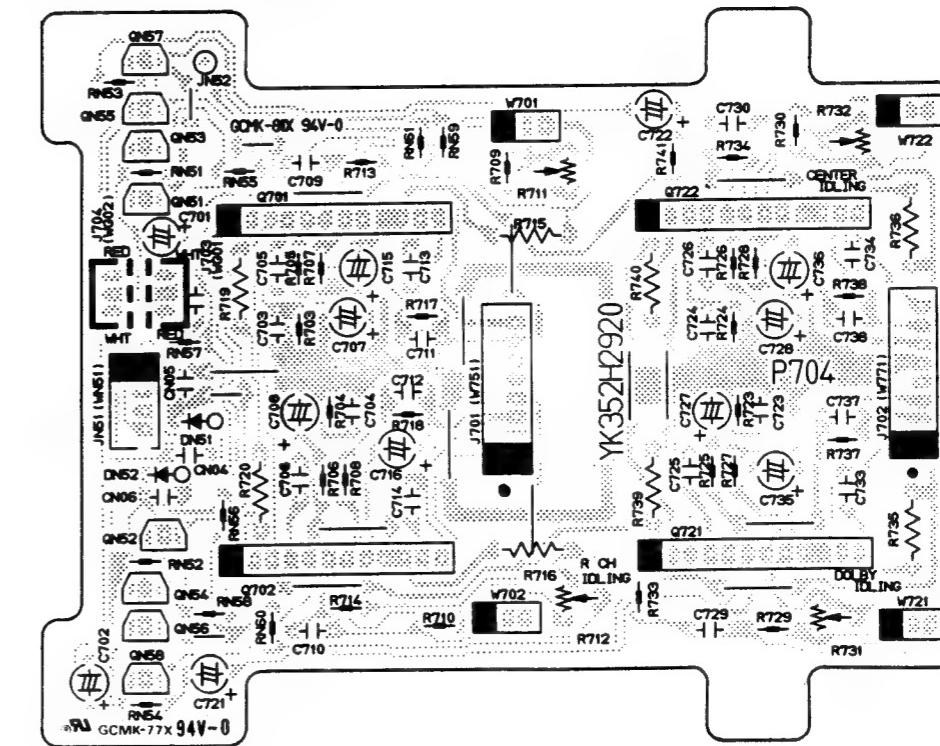
**Speaker Terminal (PW04)**



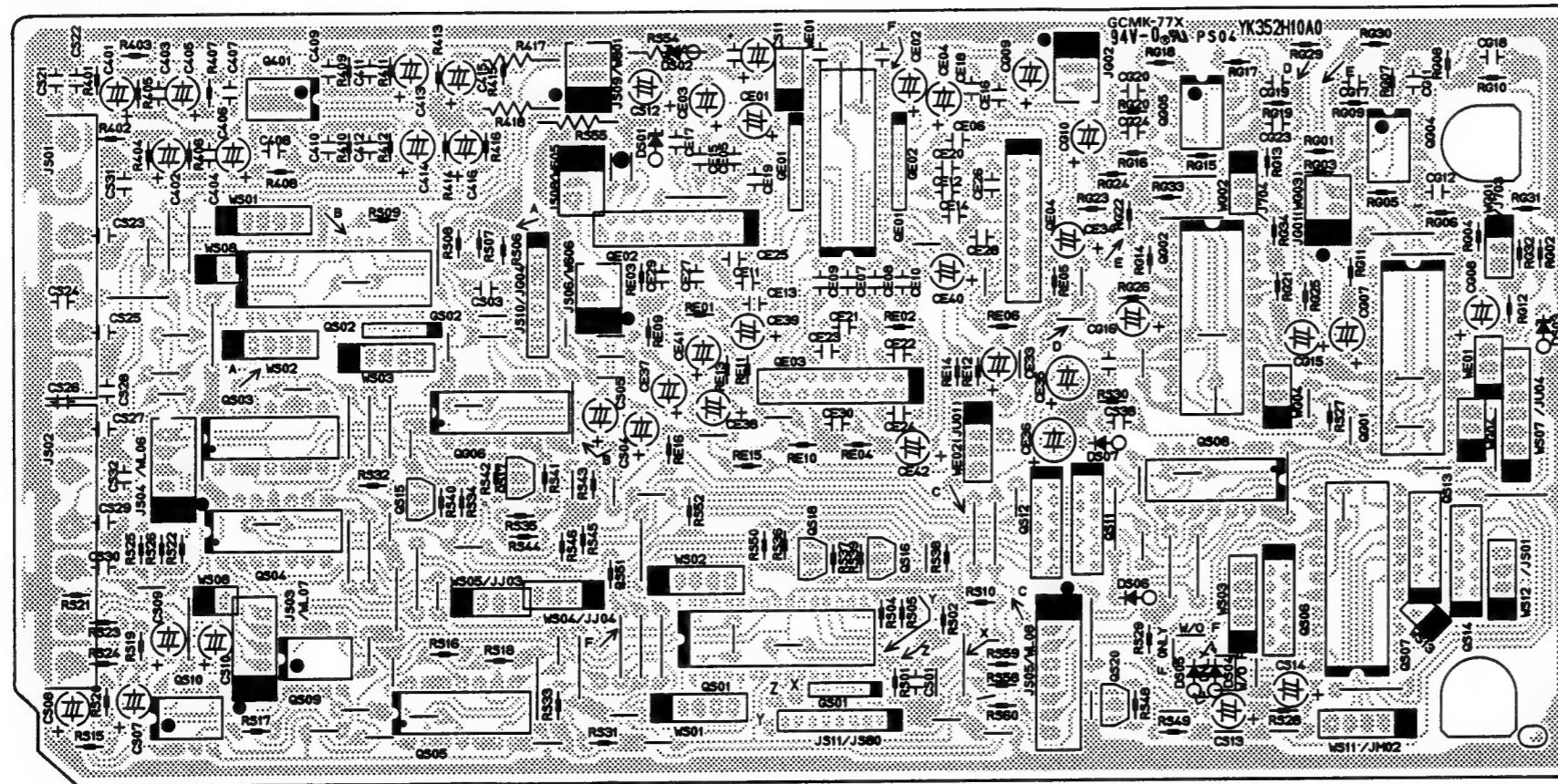
**Tact (PU24)**



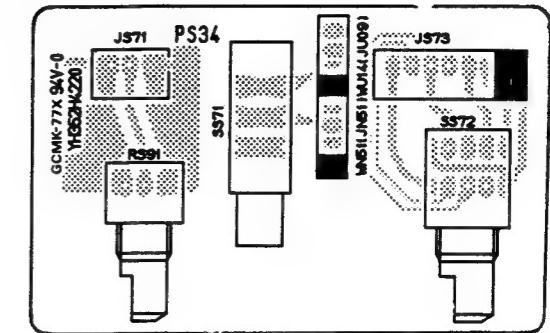
**Power Amp. Driver (P704)**



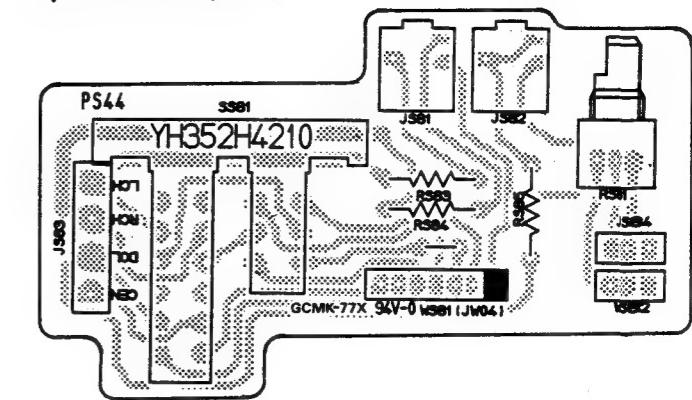
Selector (PS04)



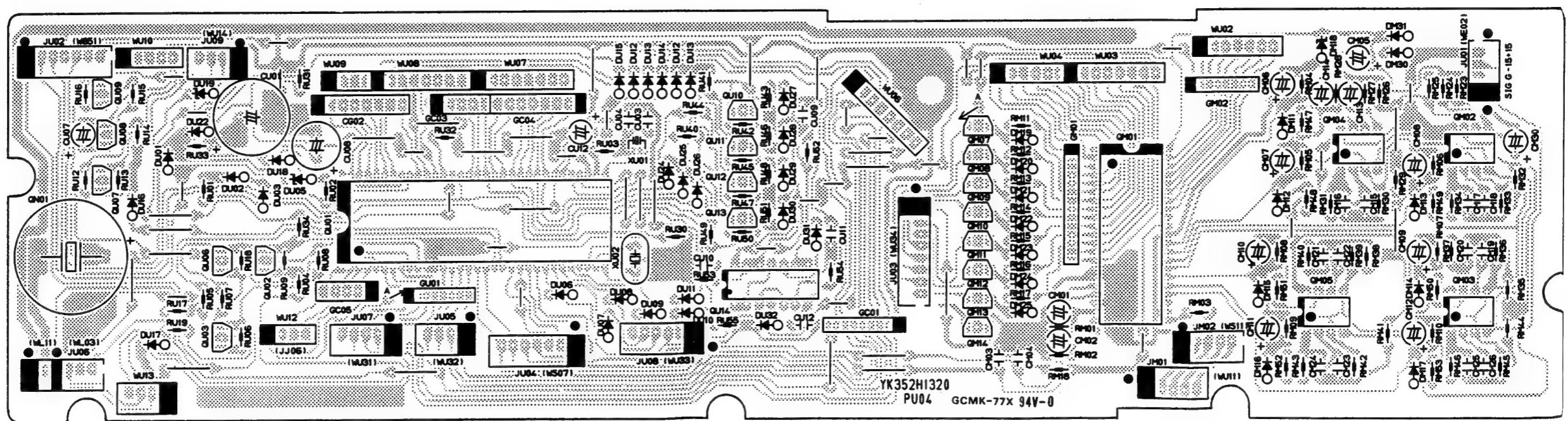
Rec Selector (PS34)



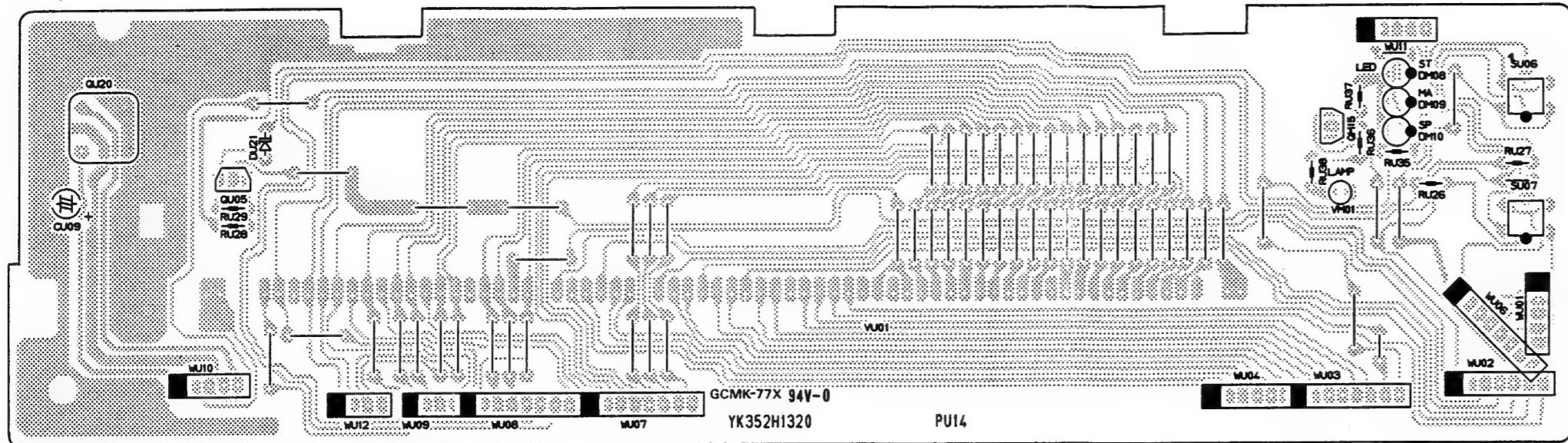
Speaker Switch (PS44)



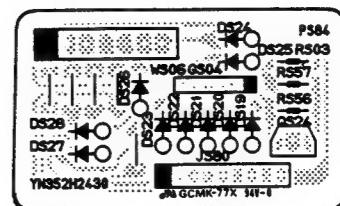
U-COM FL Driver (PU04)



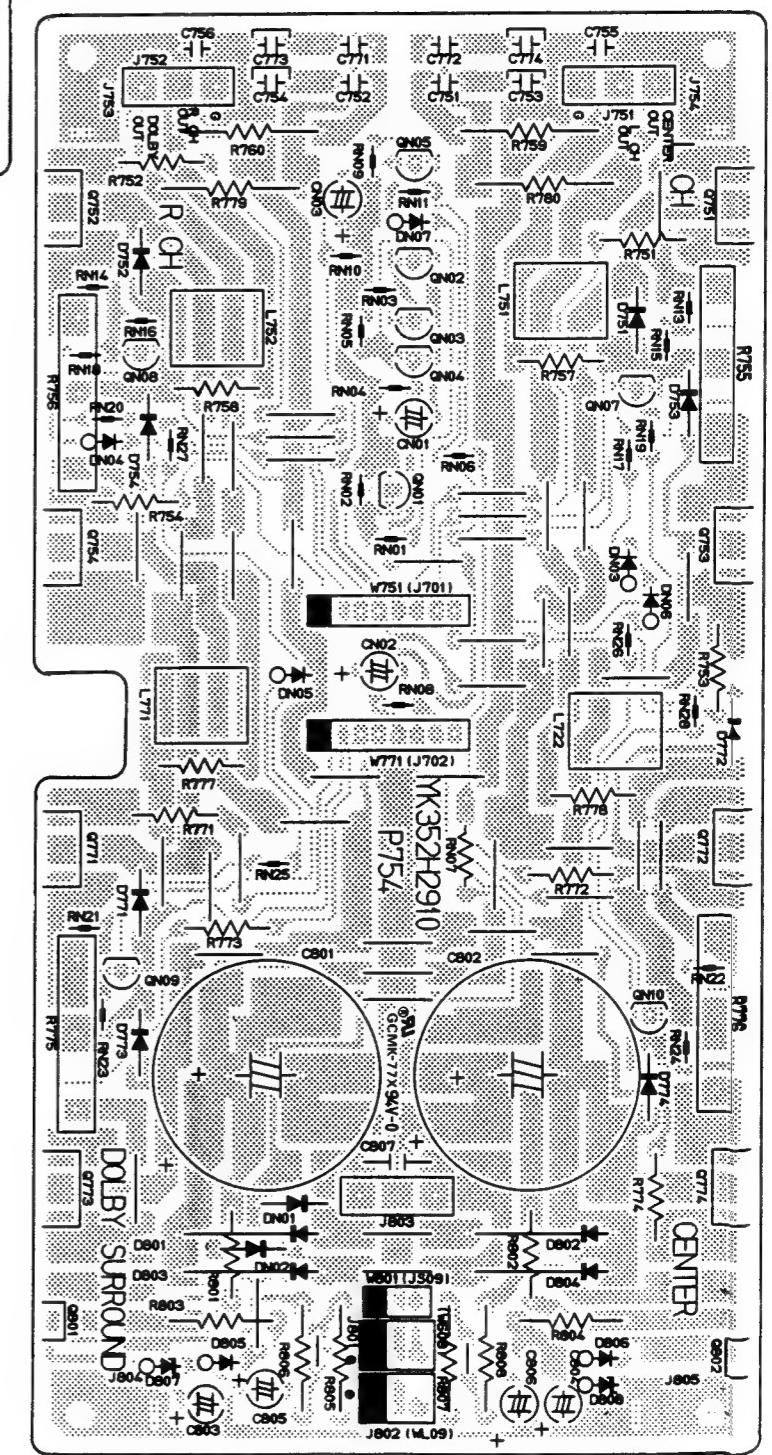
F.I.P. (PU14)



Function 1 (PS84)



Power Amp./Supply (P754)



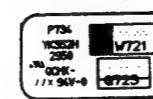
TR. L ch (P714)



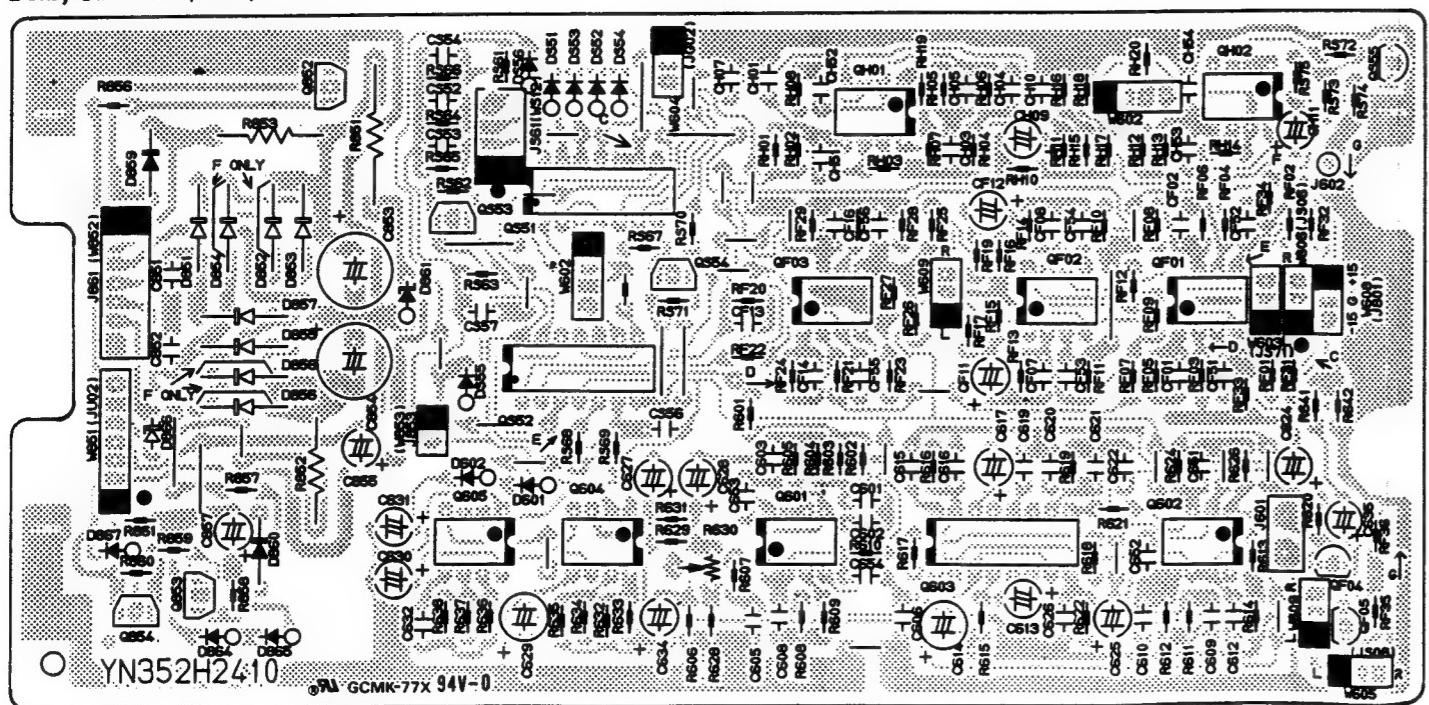
TR. R ch (P724)



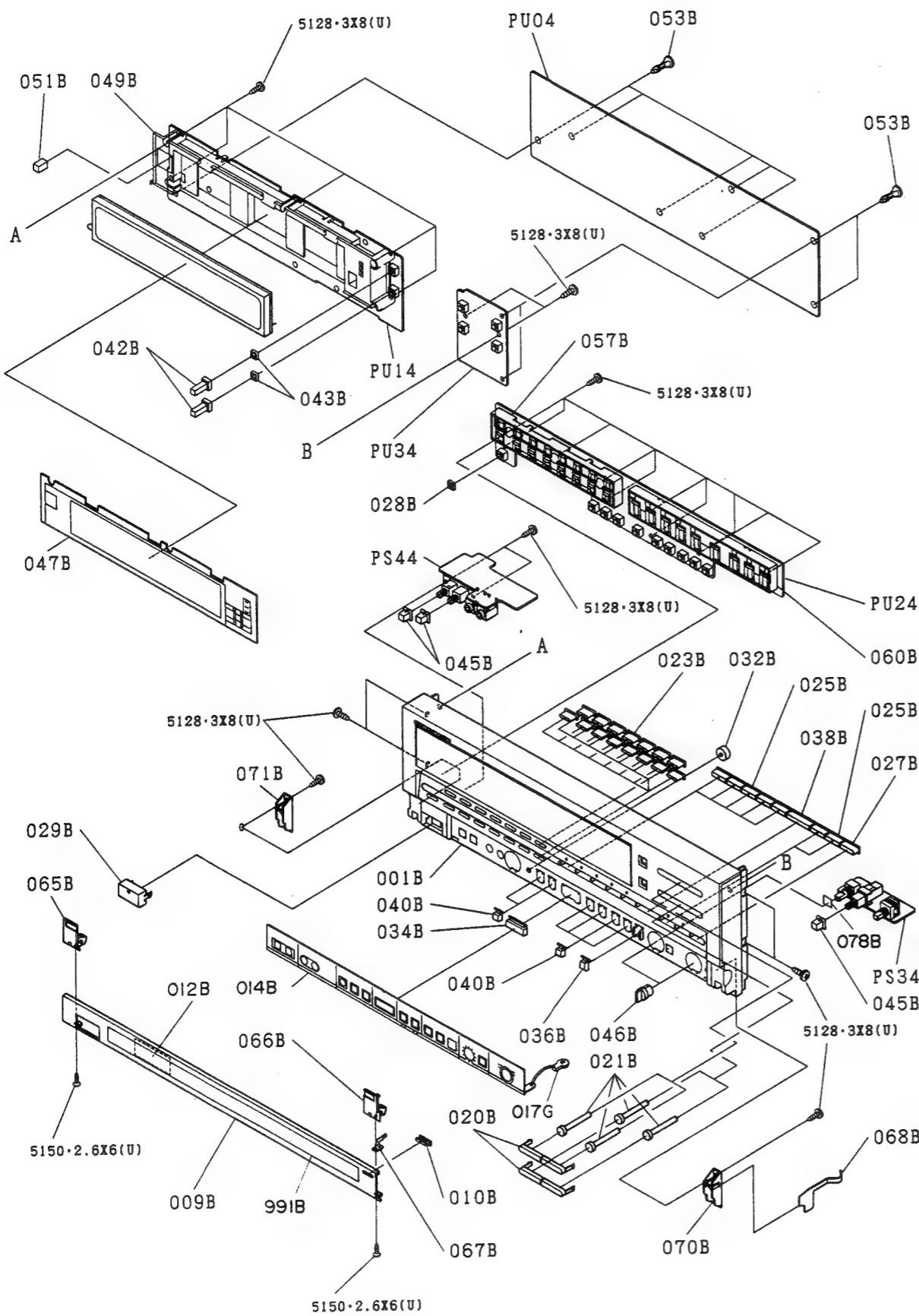
TR. Dolby (P734)



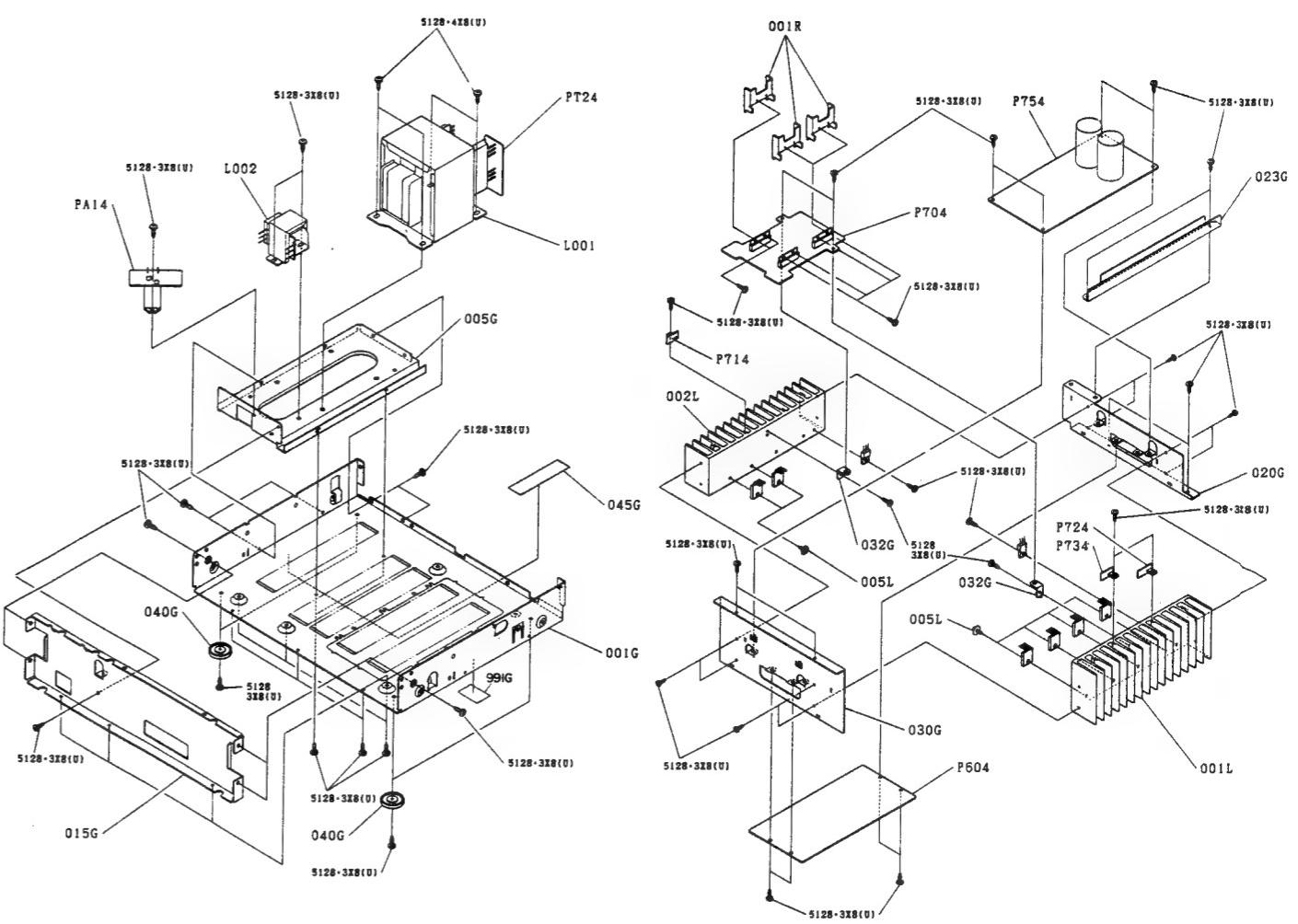
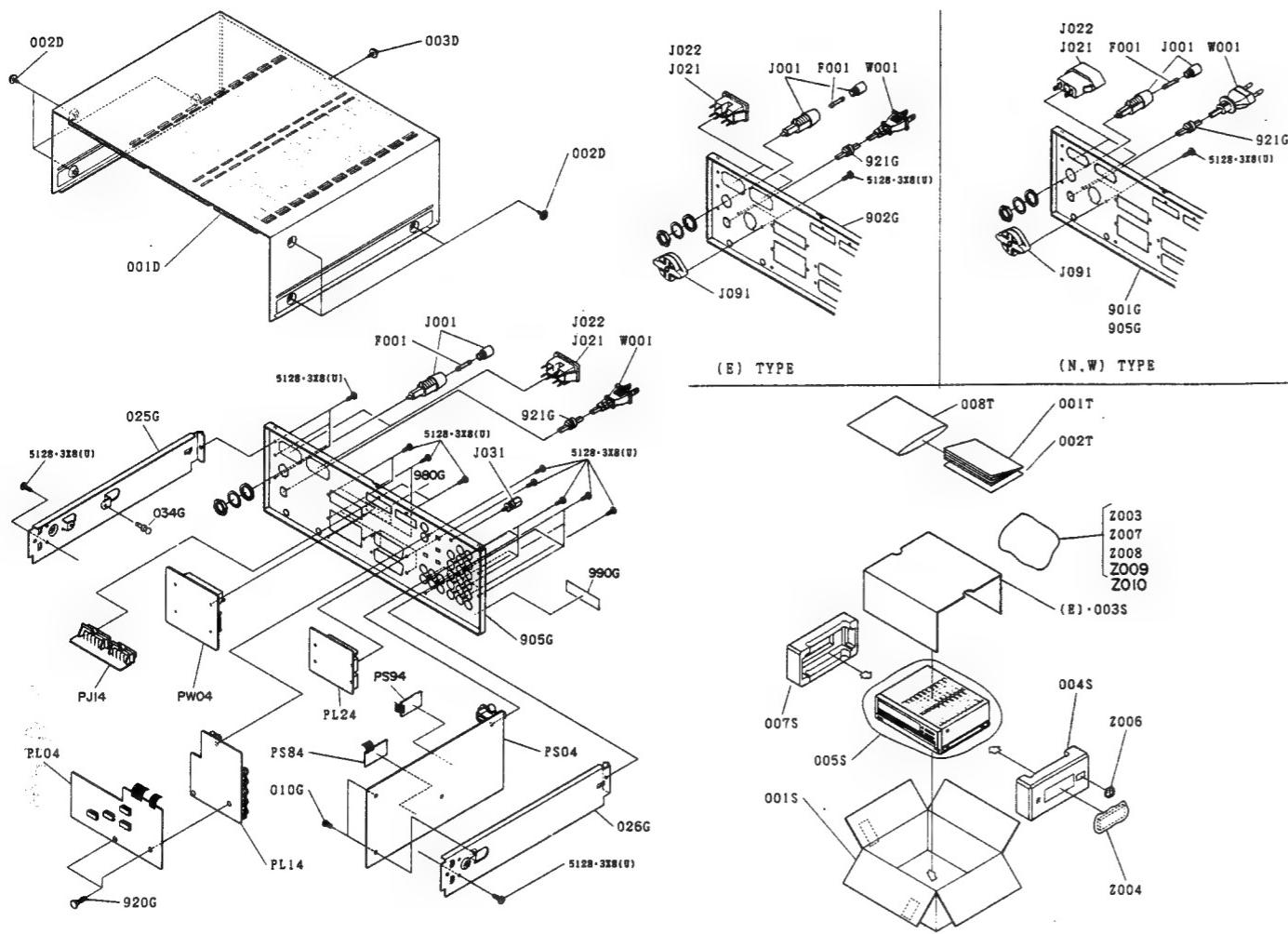
Dolby Surround (P604)



## **9. EXPLODED VIEW AND PARTS LIST**



REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 426 51191	Front Panel Assembly
009B	4822 454 11967	Escutcheon, Hinge
010B	4822 412 20998	Knob, Hinge
014B	4822 454 30391	Indicator Assembly
020B	4822 410 25819	Button, Volume
021B	4822 535 71094	Pin, Volume
023B	4822 410 25821	Button, EQ
025B	4822 410 25822	Button, Surround
027B	4822 410 25823	Button, Mode
028B	4822 532 51719	Bushing, Power Switch
029B	4822 410 25829	Button K, Power Switch
032B	4822 410 25825	Button, Timer
034B	4822 410 25826	Button, Timer Mode
036B	4822 410 25827	Button, Clear
038B	4822 410 25828	Button, EQ Flat
040B	4822 410 25782	Button, Tact
042B	4822 381 10895	Lens, Muting
043B	4822 532 51719	Bushing, Muting
045B	4822 410 25783	Button, Push
046B	4822 412 20997	Knob, Volume
065B	4822 417 10985	Hinge, Left
066B	4822 417 10986	Hinge, Right
067B	4822 278 80277	Contactor
068B	4822 278 80281	Contactor
070B	4822 526 50097	Click, Right
071B	4822 526 50096	Click, Left



REF. DESIG.	PART NO.	DESCRIPTION
001D	4822 426 51233	Lid, Top Cover
002D	4822 502 12355	B.T. Screw B3 x 8
003D	4822 502 12355	B.T. Screw B3 x 8
010G	4822 530 80277	Clamp
034G	4822 530 80277	Clamp
901G	4822 426 20118	Rear Panel [N]
902G	4822 426 20137	Rear Panel [E]
905G	4822 426 20138	Rear Panel [W]
920G	4822 535 71081	Spacer, Video P.W. Board
921G	4822 532 51314	Bushing, AC Power Cord
△ F001	4822 253 30024	Fuse 1.6A 250V
△ J001	4822 256 30233	Jack, Fuse Holder
△ J021	4822 267 30597	Jack, AC Outlet [N, W]
	4822 265 10091	Jack, AC Outlet [E]
△ J022	4822 267 30597	Jack, AC Outlet [N, W]
	4822 265 10091	Jack, AC Outlet [E]
△ J031	4822 290 40297	Terminal, GND
△ J091	4822 272 10236	Voltage Selector [N, W]
	4822 272 10235	Voltage Selector [E]
△ W001	4822 321 10428	A.C. Power Cord [N, W]
	4822 321 10429	A.C. Power Cord [E]

REF. DESIG.	PART NO.	DESCRIPTION
001S	4822 600 70472	<b>PACKING</b>
004S	4822 600 70473	Packing Case [N, W]
005S	4822 600 70347	Cushion, Right Polyethylene Sheet
001T	4822 736 13576	User Manual
008T	4822 600 70363	Polyethylene Bag
Z003	4822 321 21443	Connective Cord
Z004	4822 218 10203	Remocon Unit (RMC-73)
Z006	4822 138 10155	Battery, SUM-3
Z007	4822 321 22384	Connective Cord, 10P
Z008	4822 321 22385	Connective Cord, 13P
Z009	4822 253 30146	Fuse [E]
Z010	4822 265 10092	Jack, AC Adaptor [E]

REF. DESIG.	PART NO.	DESCRIPTION
001G	4822 464 50694	Chassis K, Main
040G	4822 462 41186	Leg
991G	4822 600 70229	Label, Caution

REF. DESIG.	PART NO.	DESCRIPTION
001R	4822 255 40581	Heatsink, Sub
△ L001	4822 148 60173	Power Transformer, Main [N, W]
	4822 148 60175	Power Transformer, Main [E]
L002	4822 148 60166	Power Transformer, Sub [N, W]
	4822 148 60174	Power Transformer, Sub [E]

## ASSIGNMENT OF COMMON PARTS CODES.

### RESISTOR

- R\*\*\*: (1) GD05 --- 140, Carbon film fixed resistor,  $\pm 5\%$ , 1/4W  
 R\*\*\*: (2) GD05 --- 160, Carbon film fixed resistor,  $\pm 5\%$ , 1/6W

① — Resistance value

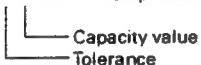
### Examples

①	Resistance value
	0.1Ω...001 10Ω...100 1kΩ...102 100kΩ...104
	0.5Ω...005 18Ω...180 2.7kΩ...272 680kΩ...684
	1Ω...010 100Ω...101 10kΩ...103 1MΩ...105
	6.8Ω...068 390Ω...391 22kΩ...223 4.7MΩ...475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

### C\*\*\*: CERAMIC CAP.

(1)	DD1 --- 370.	Ceramic condenser
		Disc type
①②		Temp. coeff. P350 ~ N1000, 50V



### Examples

①	Tolerance (Capacity deviation)
	±0.25pF...0
	±0.5pF...1
	±5%...5

\* Tolerance of COMMON PARTS handled here are as follows:

0.5pF ~ 5pF ... ±0.25pF  
 6pF ~ 10pF ... ±0.5pF  
 12pF ~ 560pF ... ±5%

②	Capacity value
	0.5pF...005 3pF...030 100pF...101
	1pF...010 10pF...100 220pF...221
	1.5pF...015 47pF...470 560pF...561

### C\*\*\*: CERAMIC CAP.

(1)	DK16 --- 300.	High dielectric constant ceramic condenser
		Disc type
①		Temp. chara. 2B4, 50V



### Example

②	Capacity value
	100pF...101 1000pF...102 10000pF...103
	470pF...471 2200pF...222

### C\*\*\*: ELECTROLY CAP. ( $\frac{1}{2}$ ), FILM CAP. ( $\frac{1}{4}$ )

(1)	EA --- 10.	Electrolytic condenser
		One-way lead type, Tolerance ±20%
①②		



### Examples

①	Capacity value
	0.1μF...104 4.7μF...475 100μF...107
	0.33μF...334 10μF...106 330μF...337
	1μF...105 22μF...226 1100μF...108

②	Working voltage
	6.3V...006 25V...025
	10V...010 35V...035
	16V...016 50V...050

(2)	DF15 --- 350.	Plastic film condenser
		One-way type, Mylar ±5% 50V



### Examples

①	Capacity value
	0.001μF (1000pF)...102 0.1μF...104
	0.0018μF.....182 0.56μF...564
	0.01μF.....103 1μF...105
	0.015μF.....153

## 10. ELECTRICAL PARTS LIST

REF. DESIG.	PART NO.	DESCRIPTION
△ G001	4822 122 40305	PA14-RELAY CIRCUIT BOARD Ceramic Cap. 0.01μF 400V
J861	4822 265 10064	Jack, 7P
△ L003	4822 280 70219 4822 280 70331	Relay [N, W] Relay [E]
JJ01 JJ02 JJ03 JJ04 JJ05 JJ06	4822 266 30305 4822 266 30306 4822 265 10105 4822 265 10061 4822 265 10064 4822 265 10105	PJ14-CONNECTOR CIRCUIT BOARD Terminal, 10P Terminal, 13P Jack, 4P Jack, 5P Jack, 7P Jack, 4P
CL04 CL07 CL10	4822 122 40297 4822 122 40297 4822 122 40297	PL04-VIDEO AMP CIRCUIT BOARD PL04-CAPACITORS Ceramic 2pF ±0.25pF Ceramic 2pF ±0.25pF Ceramic 2pF ±0.25pF
DL01 DL02 DL03 DL04 DL05 DL06 DL07 DL08 DL09 DL10	4822 130 33305 4822 130 33305 4822 130 33305 4822 130 33305 4822 130 33305 4822 130 33305 4822 130 80318 4822 130 80318 4822 130 33305 4822 130 33305	PL04-SEMICONDUCTORS Diode 1SS133, etc. Diode 1SS133, etc. Diode 1SS133, etc. [N, W] Diode 1SS133, etc. [N, W] Diode 1SS133, etc. [N, W] Diode 1SS133, etc. Zener RD6.8J Zener RD6.8J Diode 1SS133, etc. Diode 1SS133, etc.
QL01 QL02 QL03 QL04 QL05 QL08 QL09 QL13 QL22 QL23 QL24 QL25	4822 209 83067 4822 209 83067 4822 209 83832 4822 209 71781 4822 130 42483 4822 130 42483 4822 130 42483 4822 130 42483 4822 130 42715 4822 130 42715 4822 130 42715 4822 130 42715	Transistor LC4066B Transistor LC4066B Transistor LC4001B Transistor TC9135P Transistor 2SC536SP (F, G) Transistor 2SA608SP (F, G) Transistor 2SC536SP (F, G) Transistor 2SA608SP (F, G) Transistor 2SA608SP (F, G) Transistor 2SA608SP (F, G)

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
WL02 WL08 WL09	4822 323 10183 4822 323 10119 4822 323 10107	<b>PL04-MISCELLANEOUS</b> Jumper Lead, 8P Jumper Lead, 8P Jumper Lead, 3P	GE01 GE02 GS01 GS02 GS05 GS06	4822 111 91398 4822 111 91398 4822 111 91401 4822 111 91401 4822 111 91513 4822 111 91513	<b>PS04-RESISTORS</b> 100KΩx7 100KΩx7 22KΩx5 22KΩx5 100KΩx8 100KΩx8
CL23 CL24 CL25 CL26	4822 122 32486 4822 122 32486 4822 122 32486 4822 122 32486	<b>PL14-PIN JACK/SW. CIRCUIT BOARD</b>	△ RS54 △ RS55 R417 R418	4822 116 60513 4822 111 90727 4822 111 90727 4822 111 90727	150Ω ±5% ½W 220Ω ±5% ½W 220Ω ±5% ½W 220Ω ±5% ½W
QL26 QL27 QL28	4822 130 42483 4822 130 42715 4822 130 42483	<b>PL14-CAPACITORS</b> Ceramic 0.01μF +80% -20% Ceramic 0.01μF +80% -20% Ceramic 0.01μF +80% -20% Ceramic 0.01μF +80% -20%	DS01 DS02 DS03 DS06 DS07	4822 130 80318 4822 130 80318 4822 130 80317 4822 130 33305 4822 130 33305	<b>PS04-SEMICONDUCTORS</b> Zener RD6.8J Zener RD6.8J Zener RD5.1J Diode 1SS133 Diode 1SS133
JL01 JL02 JL03 JL04	4822 266 30301 4822 266 30302 4822 266 30304 4822 266 30236	<b>PL14-MISCELLANEOUS</b> Terminal, 2P; RCA Terminal, 3P; RCA Terminal, 6P; RCA Terminal, 2P; RCA	QE01 QE02 QE03 QE04	4822 209 71783 4822 209 83338 4822 209 83338 4822 209 83338	IC LC7522 IC BA3812L IC BA3812L IC BA3812L
SL01 SL02 SL03 SL04	4822 277 21146 4822 277 21146 4822 277 21146 4822 277 21146	<b>PL14-SEMICONDUCTORS</b> Slide Switch Slide Switch Slide Switch Slide Switch	QG01 QG02 QG04 QG05 QG06	4822 209 71784 4822 209 71784 4822 209 83631 4822 209 83631 4822 209 83804	IC LC7535 IC LC7535 IC NJM4558D-D IC NJM4558D-D IC LC4966
WL01 WL04 WL05 WL06 WL11	4822 323 10159 4822 323 10119 4822 323 10119 4822 323 10113 4822 323 10286	<b>PL14-MISCELLANEOUS</b> Jumper Lead, 5P Jumper Lead, 7P Jumper Lead, 7P Jumper Lead, 5P Jumper Lead, 2P	QS01 QS02 QS03 QS04 QS05 QS06 QS07 QS08 QS09 QS10	4822 209 83315 4822 209 83315 4822 209 83804 4822 209 83804 4822 209 83804 4822 209 71779 4822 209 83594 4822 209 83836 4822 209 83631 4822 209 83631	IC LC7818 IC LC7818 IC LC4966 IC LC4966 IC LC4966 IC DT5C144E IC MSM59371RS IC μPD4025BC IC NJM4558D-D IC NJM4558D-D
JL20 JL21	4822 266 30307 4822 266 30307	<b>PL24-R.G.B. CONNECTOR CIRCUIT BOARD</b> Terminal, 21P; RGB Terminal, 21P; RGB	QS11 QS12 QS13 QS14 QS15 QS16 QS17 QS18 QS20	4822 209 71779 4822 209 71778 4822 209 71779 4822 209 71778 4822 130 42715 4822 130 42715 4822 130 42715 4822 130 42715 4822 130 42483	IC DT5C144E IC DT5A144E IC DT5C144E IC DT5A144E Transistor 2SA608SP(F, G) Transistor 2SA608SP(F, G) Transistor 2SA608SP(F, G) Transistor 2SA608SP(F, G) Transistor 2SC536SP(F, G)
CS50 CS51 CS52	4822 122 32486 4822 122 32486 4822 122 40306	<b>PS04-CAPACITORS</b> Ceramic 0.01μF +80% -20% Ceramic 0.01μF +80% -20% Ceramic 0.047μF +80% -20%	Q401	4822 209 83631	IC NJM4558D-D
			JG01 JG02	4822 265 10062 4822 265 10062	<b>PS04-MISCELLANEOUS</b> Jack, 3P Jack, 3P
			JS01 JS02 JS03 JS04 JS05	4822 265 30457 4822 265 30457 4822 265 10061 4822 265 10061 4822 265 10059	Terminal, 6P; RCA Terminal, 6P; RCA Jack, 5P Jack, 5P Jack, 8P

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
JS06 JS08 JS09 JS10	4822 265 10078 4822 265 10062 4822 265 10062 4822 267 50779	Plug, 3P Jack, 3P Jack, 3P Jack, 9P	GS04	4822 111 91401	<b>PS84-FUNCTION-1 CIRCUIT BOARD</b> Resistor Composite 22KΩx5
WE01 WE02	4822 323 10107 4822 323 10143	Jumper Lead, 3P Jumper Lead, 4P	DS19 DS28	4822 130 33305	Diode 1SS133, etc.
WG01 WG02 WG03 WG04 WG05	4822 321 21744 4822 321 21744 4822 323 10107 4822 323 10105 4822 323 10104	Connective Cord, 3P Connective Cord, 3P Jumper Lead, 3P Jumper Lead, 3P Jumper Lead, 2P	QS24 QS25	4822 130 42715 4822 130 42483	Transistor 2SA608SP(F, G) Transistor 2SC536SP(F, G)
WS01 WS02 WS03 WS04 WS05 WS07 WS08 WS10 WS11 WS12	4822 323 10113 4822 323 10092 4822 323 10056 4822 323 10056 4822 323 10112 4822 323 10188 4822 323 10104 4822 323 10114 4822 323 10155 4822 323 10128	Jumper Lead, 5P Jumper Lead, 5P Jumper Lead, 5P Jumper Lead, 5P Jumper Lead, 4P Jumper Lead, 7P Jumper Lead, 2P Jumper Lead, 5P Jumper Lead, 5P Jumper Lead, 4P	JS80 WS06	4822 267 50779 4822 323 10196	Jack, 9P Jumper Lead, 7P
RS91	4822 100 20614	<b>PS34-REC SELECTOR CIRCUIT BOARD</b> Variable Resistor 100KΩ(B)	QG03 QG07 QG08	4822 209 83631 4822 209 83804 4822 130 42715	<b>PS94-FUNCTION-3 CIRCUIT BOARD</b> IC NJM4558D-D IC LC4966 Transistor 2SA608SP(F, G)
SS71 SS72	4822 276 20458 4822 273 70114	Push Switch, Surround Rotary Switch, Speaker	WT01	4822 323 10094	<b>PT24-TRANSFORMER WIRE CIRCUIT BOARD</b> Jumper Lead, 5P
JS71 JS73	4822 265 10062 4822 265 10064	Jack, 3P Jack, 7P	CU03 CU04 CU12 CU20 CU21 CU22 CU23	4822 122 32917 4822 122 32143 4822 122 40491 4822 122 40306 4822 122 40306 4822 122 40306 4822 122 40306	<b>PU04-CAPACITORS</b> Ceramic 33pF ±5% Ceramic 22pF ±5% Ceramic 0.022μF +80% -20% Ceramic 0.047μF +80% -20% Ceramic 0.047μF +80% -20% Ceramic 0.047μF +80% -20% Ceramic 0.047μF +80% -20%
WN51	4822 323 10089	Jumper Lead, 4P	GC01	4822 111 91393	<b>PU04-RESISTORS</b> 1000Px8 C.R. Composite
△ RS83 △ RS84 △ RS85	4822 111 90724 4822 111 90724 4822 111 90724	<b>PS44-SPEAKER SW. CIRCUIT BOARD</b> Resistor 330Ω ±5% ½W Resistor 330Ω ±5% ½W Resistor 330Ω ±5% ½W	GM01 GM02	4822 111 91397 4822 111 91398	100KΩx13 Composite 100KΩx7 Composite
JS81 JS82 JS83	4822 267 30834 4822 267 30834 4822 265 30544	Jack, Headphone Jack, Headphone Plug, 4P	GU01	4822 111 91398	100KΩx7 Composite
SS81	4822 276 20459	Push Switch, Speaker	DM11 DM17 DM19 DM25 DM30 DM31	4822 130 33305 4822 130 33305 4822 130 33305 4822 130 33305 4822 130 33305 4822 130 33305	<b>PU04-SEMICONDUCTORS</b> Diode 1SS133, etc. Diode 1SS133, etc. Diode 1SS133, etc. Diode 1SS133, etc. Diode 1SS133, etc.

REF. DESIG.	PART NO.	DESCRIPTION		REF. DESIG.	PART NO.	DESCRIPTION	
DU01	4822 130 33305	Diode	1SS133, etc.			<b>PU14-F.I.P. CIRCUIT BOARD</b>	
DU02	4822 130 33305	Diode	1SS133, etc.			<b>PU14-SEMICONDUCTORS</b>	
DU03	4822 130 33305	Diode	1SS133, etc.	DM08	4822 130 80326	L.E.D.	LT3D8B
DU05	4822 130 80319	Zener	RD9.1JB2	DM09	4822 130 80326	L.E.D.	LT3D8B
DU06				DM10	4822 130 80326	L.E.D.	LT3D8B
DU11	4822 130 33305	Diode	1SS133, etc.	DU21	4822 130 80316	Zener	MTZJ3.6A
DU12	4822 130 33305	Diode	1SS133, etc.	QM15	4822 130 42483	Transistor	2SC536SP(F, G)
DU15				QU05	4822 130 42715	Transistor	2SA608SP(F, G)
DU18	4822 130 33305	Diode	1SS133, etc.	QU20	4822 130 10009	Photo Unit	
DU19	4822 130 80132	Zener	RD3.9J	SU06	4822 276 11559	<b>PU14-MISCELLANEOUS</b>	
DU22				SU07	4822 276 11559	Push Switch	
DU35	4822 130 33305	Diode	1SS133, etc.	VM01	4822 134 40853	Push Switch	
QM01	4822 209 71782	IC	LC7565	VU01	4822 130 90435	Lamp	12V
QM02	4822 209 80401	IC	NJM4558D-D	WU01	4822 323 10159	Display Unit	FIP18BMW24
QM03	4822 209 80401	IC	NJM4558D-D	WU02	4822 323 10117	Jumper Lead, 5P	
QM04	4822 209 80401	IC	NJM4558D-D	WU04	4822 323 10169	Jumper Lead, 7P	
QM05	4822 209 80401	IC	NJM4558D-D	WU07	4822 323 10183	Jumper Lead, 6P	
QM07				WU08	4822 323 10183	Jumper Lead, 8P	
QM14	4822 130 42483	Transistor	2SC536SP(F, G)	WU10	4822 323 10159	Jumper Lead, 8P	
QN01	4822 280 10191	Elect Buzzer		WU11	4822 323 10159	Jumper Lead, 5P	
QU01	4822 209 71787	Microprocessor	$\mu$ PD75208	WU12	4822 323 10111	Jumper Lead, 5P	
QU02	4822 130 42483	Transistor	2SC536SP(F, G)			<b>PU24-TACT SWITCH CIRCUIT BOARD</b>	
QU03	4822 130 42715	Transistor	2SA608SP(F, G)			<b>PU24-SEMICONDUCTORS</b>	
QU06	4822 130 42483	Transistor	2SC536SP(F, G)	DM01	4822 130 80326	L.E.D.	LT3D8B
QU07	4822 130 42715	Transistor	2SA608SP(F, G)	DM07	4822 130 80326		
QU08	4822 130 42483	Transistor	2SC536SP(F, G)			<b>PU24-MISCELLANEOUS</b>	
QU09	4822 130 42715	Transistor	2SA608SP(F, G)	SU03	4822 276 11559	Push Switch, Tact	
QU10	4822 130 42483	Transistor	2SC536SP(F, G)	SU08	4822 276 11559	Push Switch, Tact	
QU11	4822 130 42483	Transistor	2SC536SP(F, G)	>	4822 276 11559	Push Switch, Tact	
QU12	4822 130 42483	Transistor	2SC536SP(F, G)	SU39	4822 276 11656	Push Switch, Tact REDLED	
QU13	4822 130 42483	Transistor	2SC536SP(F, G)	SU40	4822 276 11656		
QU14	4822 209 83832	IC	4001	WU31	4822 323 10113	Jumper Lead, 5P	
<b>JM04-MISCELLANEOUS</b>				WU32	4822 323 10087	Jumper Lead, 4P	
JM01	4822 265 10061	Jack, 5P		WU33	4822 323 10058	Jumper Lead, 6P	
JM02	4822 265 10061	Jack, 5P		WU34	4822 323 10158	Jumper Lead, 8P	
JU01	4822 265 10105	Jack, 4P				<b>PU34-TACT SWITCH CIRCUIT BOARD</b>	
JU02	4822 265 10064	Jack, 6P		SU01	4822 276 11559	Push Switch, Tact	
JU03	4822 265 10059	Jack, 7P		SU02	4822 276 11559	Push Switch, Tact	
JU04	4822 265 10064	Jack, 6P		SU04	4822 276 11559	Push Switch, Tact	
JU05	4822 265 10105	Jack, 4P		SU05	4822 276 11559	Push Switch, Tact	
JU06	4822 265 10063	Jack, 6P					
JU07	4822 265 10061	Jack, 5P					
JU08	4822 265 10063	Jack, 6P					
JU09	4822 265 10105	Jack, 4P					
WU03	4822 323 10183	Jumper Lead, 8P					
WU06	4822 323 10061	Jumper Lead, 8P					
XU01	4822 242 71775	Crystal	32.768KHz				
XU02	4822 242 71774	Ceramic Bibrator	4.19MHz				

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
		<b>PU54-U-COM 2 CIRCUIT BOARD</b>	△D856	4822 130 32508	Diode DSF10C, etc. [N, W]
DU51	4822 130 33305	<b>PU54-SEMICONDUCTORS</b>	△D857	4822 130 32508	Diode DSF10C, etc.
DU55	4822 130 33305	Diode 1SS133, etc.	△D858	4822 130 32508	Diode DSF10C, etc. [N, W]
DU57	4822 130 33305	Diode 1SS133, etc.	D859	4822 130 32508	Diode DSF10C, etc.
QU51	4822 209 70088	IC HD14011BP	D860	4822 130 32508	Diode DSF10C, etc.
QU52	4822 209 70088	IC HD14011BP	D861	4822 130 33948	Zener RD5.6J
QU53	4822 130 42483	Transistor 2SC536SP(F, G)	D864	4822 130 33305	Diode 1SS133, etc.
QU54	4822 130 42715	Transistor 2SA608SP(F, G)	D865	4822 130 33305	Diode 1SS133, etc.
QU55	4822 130 42483	Transistor 2SC536SP(F, G)	D866	4822 130 80091	Zener RD12J
QU56	4822 130 42715	Transistor 2SA608SP(F, G)	D867	4822 130 33305	Diode 1SS133, etc.
QU57	4822 130 42483	Transistor 2SC536SP(F, G)	QF01	4822 209 83631	IC NJM4558D-D
JU51	4822 265 10063	<b>PU54-MISCELLANEOUS</b>	QF02	4822 209 83631	IC NJM4558D-D
JU52	4822 265 10061	Jack, 6P	QF03	4822 209 83631	IC NJM4558D-D
WN52	4822 323 10226	Jack, 5P	QS51	4822 209 83804	IC LC4966
		Jumper Lead, 4P	QS52	4822 209 83804	IC LC4966
		<b>PW04-SPEAKER TERMINAL CIRCUIT BOARD</b>	QS53	4822 130 42715	Transistor 2SA608SP(F, G)
JW01	4822 267 20233	Terminal, 8P; Speaker	QS54	4822 130 42483	Transistor 2SC536SP(F, G)
JW02	4822 266 30308	Terminal, 4P; Speaker	Q601	4822 209 83631	IC NJM4558D-D
JW03	4822 264 30226	Plug, 2P	Q602	4822 209 83631	IC NJM4558D-D
JW04	4822 265 10217	Jack, 6P	Q603	4822 209 82826	IC TA7629P
		<b>P604-DOLBY SURROUND CIRCUIT BOARD</b>	Q604	4822 209 71777	IC MN3007
			Q605	4822 209 81763	IC MN3101
C851	4822 122 32486	<b>P604-CAPACITORS</b>	Q852	4822 130 60839	Transistor 2SC2458(Y, GR)
C852	4822 122 32486	Ceramic 0.01μF +80% -20%	Q853	4822 130 42483	Transistor 2SC536SP(F, G)
R630	4822 100 11042	<b>P604-RESISTORS</b>	Q854	4822 130 42715	Transistor 2SA608SP(F, G)
△R851	4822 116 60268	47KΩ, Trimming	JS51	4822 265 10105	<b>P604-MISCELLANEOUS</b>
△R852	4822 116 60246	680Ω ±5% 2W	J601	4822 265 10158	Jack, 4P
△R853	4822 116 60246	220Ω ±5% 1W [A]			Plug, 2P
DS51	4822 130 33305	<b>P604-SEMICONDUCTORS</b>	W602	4822 323 10111	Jumper Lead, 4P
DS56	4822 130 33305	Diode 1SS133, etc.	W603	4822 323 10108	Jumper Lead, 3P
D601	4822 130 33305	Diode 1SS133, etc.	W606	4822 321 21744	Connective Cord, 3P
D602	4822 130 33305	Diode 1SS133, etc.	W608	4822 323 10076	Jumper Lead, 3P
△D851	4822 130 32508	<b>P604-CAPACITORS</b>	W851	4822 323 10154	Jumper Lead, 7P
△D852	4822 130 32508	Diode DSF10C, etc. [N, W]	W852	4822 323 10154	Jumper Lead, 7P
△D853	4822 130 32508	Diode DSF10C, etc.			<b>P704-POWER AMP DRIVER CIRCUIT BOARD</b>
△D854	4822 130 32508	Diode DSF10C, etc. [N, W]			<b>P704-CAPACITORS</b>
△D855	4822 130 32508	Diode DSF10C, etc.	CN04	4822 122 32486	Ceramic 0.01μF +80% -20%
			CN06		
			R711	4822 100 20524	<b>P704-RESISTORS</b>
			R712	4822 100 20524	4.7KΩ, Trimming
			△R715	4822 116 60314	4.7KΩ, Trimming
			△R716	4822 116 60314	10Ω ±5% ¼W, Fusible
			△R719	4822 116 60314	10Ω ±5% ¼W, Fusible
			△R720	4822 116 60314	10Ω ±5% ¼W, Fusible
			R731	4822 100 20524	4.7KΩ, Trimming
			△R735	4822 116 60314	10Ω ±5% ¼W, Fusible
			△R739	4822 116 60314	10Ω ±5% ¼W, Fusible

REF. DESIG.	PART NO.	DESCRIPTION
		<b>P704-SEMICONDUCTORS</b>
DN51	4822 130 33305	Diode 1SS133, etc.
DN52	4822 130 33305	Diode 1SS133, etc.
DN53	4822 130 33305	Diode 1SS133, etc.
DN54	4822 130 80091	Zener RD12J
QN51	4822 130 43818	Transistor 2SC2878(A)
QN54	4822 130 43818	Transistor 2SC2878(A)
QN56	4822 130 43818	Transistor 2SC2878(A)
QN58	4822 130 43818	Transistor 2SC2878(A)
Q701	4822 209 83779	IC $\mu$ PC1270H
Q702	4822 209 83779	IC $\mu$ PC1270H
Q721	4822 209 83779	IC $\mu$ PC1270H
JN51	4822 265 10105	<b>P704-MISCELLANEOUS</b>
		Jack, 4P
J701	4822 265 10059	Jack, 8P
J702	4822 265 10061	Jack, 5P
J703	4822 265 10078	Plug, 3P
J704	4822 265 10078	Plug, 3P
W701	4822 323 10105	Jumper Lead, 3P
W702	4822 323 10105	Jumper Lead, 3P
W721	4822 323 10105	Jumper Lead, 3P
Q703	4822 130 60117	<b>P714-TRANSISTOR (L-CH) CIRCUIT BOARD</b>
		Transistor 2SC3419(Y)
Q704	4822 130 60117	<b>P724-TRANSISTOR (R-CH) CIRCUIT BOARD</b>
		Transistor 2SC3419(Y)
Q723	4822 130 60117	<b>P734-TRANSISTOR (DOLBY) CIRCUIT BOARD</b>
		Transistor 2SC3419(Y)
		<b>P754-POWER AMP/SUPPLY CIRCUIT BOARD</b>
C801	4822 124 21861	<b>P754-CAPACITORS</b>
C802	4822 124 21861	Elect 10000 $\mu$ F 50V
$\Delta$ C807	4822 122 30043	Elect 10000 $\mu$ F 50V
		Ceramic 0.01 $\mu$ F +80% -20%

REF. DESIG.	PART NO.	DESCRIPTION
		<b>P754-RESISTORS</b>
$\Delta$ RN07	4822 116 60314	10 $\Omega$ $\pm 5\%$ $\frac{1}{4}$ W, Fusible
$\Delta$ R751	4822 116 52332	10 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R752	4822 116 52332	10 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R753	4822 116 52332	10 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R754	4822 116 52332	10 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R755	4822 111 91402	0.1 $\Omega$ $\times 2$ 3W
$\Delta$ R756	4822 111 91402	0.1 $\Omega$ $\times 2$ 3W
$\Delta$ R757	4822 116 52858	4.7 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R758	4822 116 52858	4.7 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R759	4822 111 90726	10 $\Omega$ $\pm 5\%$ 2W
$\Delta$ R760	4822 111 90726	10 $\Omega$ $\pm 5\%$ 2W
$\Delta$ R771	4822 116 52332	10 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R773	4822 116 52332	10 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R775	4822 111 91402	0.1 $\Omega$ $\times 2$ 3W
$\Delta$ R777	4822 116 52858	4.7 $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W
$\Delta$ R779	4822 111 90726	10 $\Omega$ $\pm 5\%$ 2W
$\Delta$ R801	4822 116 60308	2.2 $\Omega$ $\pm 5\%$ $\frac{1}{4}$ W, Fusible
$\Delta$ R802	4822 116 60308	2.2 $\Omega$ $\pm 5\%$ $\frac{1}{4}$ W, Fusible
$\Delta$ R803	4822 116 60346	2.2K $\Omega$ $\pm 5\%$ 1W
$\Delta$ R804	4822 116 60346	2.2K $\Omega$ $\pm 5\%$ 1W
$\Delta$ R805	4822 116 60266	47 $\Omega$ $\pm 5\%$ 1W
$\Delta$ R806	4822 116 60266	47 $\Omega$ $\pm 5\%$ 1W
$\Delta$ R807	4822 116 60266	47 $\Omega$ $\pm 5\%$ 1W
$\Delta$ R808	4822 116 60266	47 $\Omega$ $\pm 5\%$ 1W
		<b>P754-SEMICONDUCTORS</b>
$\Delta$ DN01	4822 130 32508	Diode DSF10C, etc.
$\Delta$ DN02	4822 130 32508	Diode DSF10C, etc.
DN03	4822 130 33305	Diode 1SS133, etc.
DN04	4822 130 33305	Diode 1SS133, etc.
DN05	4822 130 33305	Diode 1SS133, etc.
DN07	4822 130 33305	Diode 1SS133, etc.
$\Delta$ D751	4822 130 32508	Diode DSF10C, etc.
$\Delta$ D752	4822 130 32508	Diode DSF10C, etc.
$\Delta$ D753	4822 130 32508	Diode DSF10C, etc.
$\Delta$ D754	4822 130 32508	Diode DSF10C, etc.
$\Delta$ D771	4822 130 32508	Diode DSF10C, etc.
$\Delta$ D773	4822 130 32508	Diode DSF10C, etc.
$\Delta$ D801	4822 130 33063	Diode S3V20
$\Delta$ D802	4822 130 33063	Diode S3V20
$\Delta$ D803	4822 130 33063	Diode S3V20
$\Delta$ D804	4822 130 33063	Diode S3V20
D805	4822 130 33305	Diode 1SS133, etc.
D806	4822 130 33305	Diode 1SS133, etc.
D807	4822 130 80498	Zener RD16J
D808	4822 130 80498	Zener RD16J
QN01	4822 130 42715	Transistor 2SA608SP(F, G)
QN02	4822 130 42052	Transistor 2SC2785(FF, EF)
QN03	4822 130 42483	Transistor 2SC2458, etc.
QN04	4822 130 42483	Transistor 2SC2458, etc.
QN05	4822 130 42591	Transistor 2SA1175(FF, EF)
QN07	4822 130 42052	Transistor 2SC2785(FF, EF)
QN08	4822 130 42052	Transistor 2SC2785(FF, EF)
QN09	4822 130 42052	Transistor 2SC2785(FF, EF)

REF. DESIG.	PART NO.	DESCRIPTION	
Q751	4822 130 60698	Transistor	2SD1714(S, P)
Q752	4822 130 60698	Transistor	2SD1714(S, P)
Q753	4822 130 60695	Transistor	2SB1159(S, P)
Q754	4822 130 60695	Transistor	2SB1159(S, P)
Q771	4822 130 60698	Transistor	2SD1714(S, P)
Q773	4822 130 60695	Transistor	2SB1159(S, P)
△ Q801	4822 130 42073	Transistor	2SD1265(O, P)
△ Q802	4822 130 43023	Transistor	2SA1306(O, Y)
<b>P754-MISCELLANEOUS</b>			
J751	4822 265 20205	Plug, 3P	
J752	4822 265 20205	Plug, 3P	
J755	4822 265 10097	Jack, 3P	
J801	4822 265 10062	Jack, 3P	
J802	4822 265 10062	Jack, 3P	
J803	4822 265 20205	Plug, 3P	
J804	4822 290 40209	Terminal, Earth	
J805	4822 290 40209	Terminal, Earth	
L751	4822 157 51739	Coil, 1μH	
L752	4822 157 51739	Coil, 1μH	
L771	4822 157 51739	Coil, 1μH	
W751	4822 323 10244	Jumper Lead, 8P	
W771	4822 323 10238	Jumper Lead, 5P	
W801	4822 323 10083	Jumper Lead, 3P	

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

# TUNER SECTION

## 1. TEST EQUIPMENT REQUIRED FOR SERVICING

Item	Use
AM Signal Generator	Signal source for AM alignment
Test Loop	Use with AM signal generator
FM Signal Generator	Signal source for FM alignment
MPX Signal Generator	Stereo separation alignment and trouble shooting
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
AC VTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO alignment
Frequency Counter	MPX oscillator adjustment (VCO)
Circuit Tester	Trouble shooting
DC VTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to tuner
Line Voltmeter	Monitors potential of primary power to tuner
Variable Autotransformer (0 ~ 140V AC, 10A)	Adjusts level of primary power to tuner

## 2. P.W. BOARDS

As can be seen from the circuit diagram the chassis of Model ST673/ST673L consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. Tuner ..... mounted on P.W. Board P102
2. Preset Mode ..... mounted on P.W. Board PT02
3. Preset UP/DOWN .... mounted on P.W. Board PS02
4. Input Output ..... mounted on P.W. Board PW02

### 3. TUNER ALIGNMENT PROCEDURES

A dummy resistor of 47 kohms must be connected across the tuner output terminals before alignment.

#### 3.1 FM Alignment Procedures (Function switch in the "FM" position, MODE switch in the MONO position.)

##### 1. FM RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	FM signal generator to FM antenna terminal ( $75\Omega$ ) through matching network Set the SG RF output level so that some noise can be observed on the upper and lower side of the output waveform.	98.00 MHz	VTVM to L or R channel output (JW02, ⑨ or ⑩)	98.00 MHz	FRONT END IFT (A101: L8) for maximum output and minimum distortion.
2	FM signal generator 500 $\mu$ V output to FM antenna terminal ( $75\Omega$ ) through matching network Modulation Level DIN 40 kHz DEV. IHF 75 kHz DEV.	98.00 MHz	"O" center meter or DC current meter in 100 $\mu$ A range (J201)	98.00 MHz	L201 (Primary) core so that the meter indicates its center or may read "O".
3	FM signal generator 500 $\mu$ V output to FM antenna terminal ( $75\Omega$ ) through matching network.	98.00 MHz	Distortion meter to L or R channel output (JW02, ⑨ or ⑩)	98.00 MHz	L201 (Secondary) core for minimum distortion.

#### 3.2 Muting Level Alignment (Function switch in the "FM" position, MODE switch in the "AUTO STEREO" position.)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	FM signal generator 6.3 $\mu$ V output to FM antenna terminal through matching network ( $75\Omega$ )	98.00 MHz	VTVM to L or R channel output (JW02, ⑨ or ⑩)	98.00 MHz	Adjust R211 until output is developed.

#### 3.3 Multiplex Alignment Procedures (Function switch in the "FM" position, MODE switch in the "AUTO STEREO" position.)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	FM signal generator 500 $\mu$ V output modulated by MPX signal generator to FM antenna terminal ( $75\Omega$ ) through matching network Modulation Level DIN 40 kHz+8% Pilot DEV. IHF 67.5kHz+9% Pilot DEV.	No modulation	Frequency counter to (J301)	98.00 MHz	R314 so that Frequency may precisely read 228.0 kHz.
2		Stereo left (1,000 Hz)	VTVM to right channel output (JW02 ⑩)		R301 for same separation in both channels.
3		Stereo right (1,000 Hz)	VTVM to left channel output (JW02 ⑨)		
4	Repeat steps 2 and 3.				
5	RF generator to FM antenna terminals through matching network ( $75\Omega$ ) with 500 $\mu$ V FM stereo signal.	Pilot only	VTVM to right and left channel output (JW02 ⑨ or ⑩)	98.00 MHz	R312 so that minimum output should be the same in both channels.

#### 3.4 AM Alignment Procedures (Function switch in the "AM" position.)

##### 1. AM IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Sweep generator to AM Antenna Terminal.	450 kHz marker	Oscilloscope to (RA15)	—	FA01 for maximum and symmetric response.

## AM RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Apply the signal to the AM loop antenna from the AM signal generator using the test loop.	603 kHz (600 kHz)	VTVM to L or R channel output (JW02 ⑨ or ⑩)	603 kHz (600 kHz)	LA01 for maximum output.
2		1,404 kHz (1,400 kHz)		1,404 kHz (1,400 kHz)	CA01 for maximum output.
3	Repeat steps 1 and 2.				

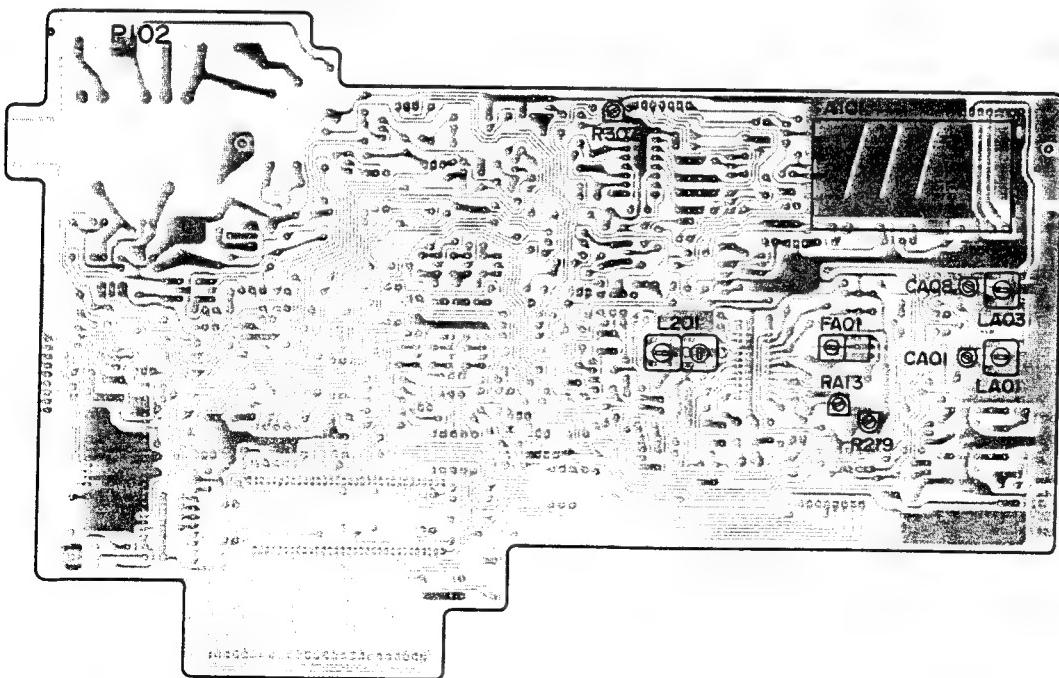
## AM Signal Alignment (Function switch in the "AM" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Apply a signal to the AM loop antenna from the RF generator via the test test loop. 500µV signal	999 kHz (1000 kHz)	—	999 kHz (1000 kHz)	Adjust RA13 so that light. "TUNED"

## LW RF Alignment (Function in the "LW" position) ST673L Only

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Apply the signal to the AM loop antenna from the RF generator using the test loop.	173 kHz	VTVM to L or R channel output (JW02, ⑨ or ⑩)	173 kHz	LA03 for maximum output.
2		272 kHz		272 kHz	CA08 for maximum output.
3	Repeat steps 1 and 2 as necessary to obtain maximum sensitivity.				

## 4. TEST POINT AND ALIGNMENT POINTS



## 5. ONE-CHIP MICROPROCESSOR FOR TUNER-LC6514B-3357 (Q505)

### 1. Receiving Frequency Range, Channel Space, Reference Frequency, Intermediate Frequency

			Channel Space	Reference Frequency	Intermediate Frequency
Europe	FM	87.5 – 108.0MHz	50kHz	25kHz	+10.7MHz
	MW	531 – 1602kHz	9kHz	9kHz	+450kHz
	LW	152 – 282kHz	1kHz	1kHz	+450kHz

### 2. Tuning Function

- 1) Automatic Up/Down Tuning (sawtooth wave mode)
- 2) Manual Up/Down Tuning

The frequency changes in steps when the momentary switch is pressed or rapidly at a speed of approximately 70ms/step when the switch is depressed for 0.5 seconds or more. If the finger is released automatic tuning is performed.

#### 3) Preset Memory Recall

16 FM stations + 8 AM stations

For FM, 8 keys x 2 = 16

M1 to M8 when keys pressed for less than 0.5 sec.  
M9 to M16 when keys pressed for more than 0.5 sec.

For AM (MW + LW) – 8

M1 to M8 (random for MW and LW)

### 3. Remote Control Function

Remote control operation with Philips RC-5 bus code signals.

- a) Band switching
- b) Preset recall
- c) Tuning up/down
- d) Mode (mono/stereo) switching

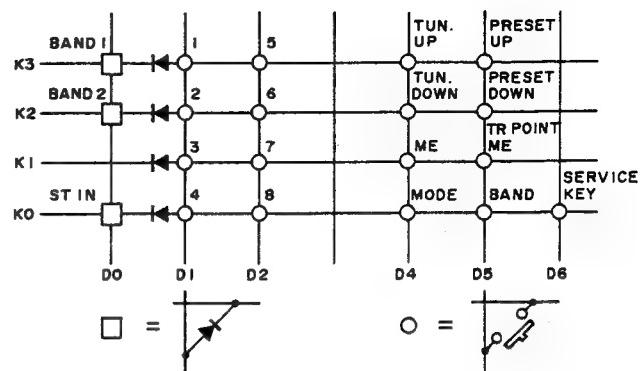
### 4. Easy Bus Out Function

The signal for switching the audio amplifier's input selector to TUNER is output as an RC-5 bus code.  
(For band switching, preset recall, and tuning up/down)

### 5. IF Count Function

For the LW band only, when the SD pin becomes high after the PLL frequency is changed, the IF frequency is counted and "TUNED" lights on the fluorescent display if the result is 450 kHz. If in the auto scan mode, scanning stops. (There is no IF count function for the FM and MW bands.)

### 6. Key Matrix



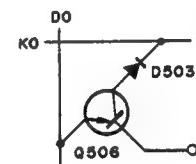
#### Description of Keys

- \* **BAND 1, BAND 2** Initial setting diodes for directivity selection

	USA	JAPAN	EUROPE (w/o LW)	EUROPE (w/ LW)	
BAND 1	0	1	0	1	BAND 1: D501 BAND 2: D502
BAND 2	0	0	1	1	0: No diode 1: Diode

- \* **ST IN** (Transistor switch)

Inputs PLL IC LM7000 ST. OUT. (When IF frequency becomes  $450 \pm 0.6$  kHz, ST. OUT becomes low and transistor switch turns ON.)



- \* **1 – 8** Preset memory setting and recall keys

- \* **TUNE UP, DOWN** Tuning up and down keys

The frequency increases or decreases by 1 step when pressed once (0.5 sec. or less) and changes continuously at a speed of approximately 70 ms/step when pressed for more than 0.5 seconds. If the finger is released, automatic tuning is performed.

- \* **ME** Memory setting key

When the key is pressed, "MEMORY" will light for approximately 5 seconds indicating that memory setting is possible. If pressed again, "MEMORY" will remain lit for another 5 seconds.

For AM, the frequency is stored at that key number when any key is pressed. For FM, the frequency is stored at numbers 1 to 8 if the keys are pressed for less than 0.5 seconds, and at numbers 9 to 16 if the keys are pressed for more than 0.5 seconds.

- \* **MODE** Mono/stereo output select key

When pressed in FM, the mono/stereo output changes cyclicly between low and high. This can also be stored in the memory with the preset memory frequency.

\* **BAND** Band select key. Band switches each time key is pressed.

**FM** → **AM** (w/o LW)

**FM** → **MW** → **LW** (w/ LW)

\* **PRESET UP**, **DOWN** Preset scan up and down keys  
The preset address increases or decreases by 1 step when pressed once (0.5 sec. or less) and changes continuously at a speed of approximately 0.5 sec/step when pressed for more than 0.5 seconds.

#### **TR POINT ME** (Tracking point memory key)

When test point J501 ① and ② on the P102 P.W. board are shorted, the following frequencies are written into the memory:

FM: P1=90.0 MHz, P2=98.0 MHz, P3=106.0 MHz

AM: P1=603 kHz, P2=999 kHz, P3=1404 kHz

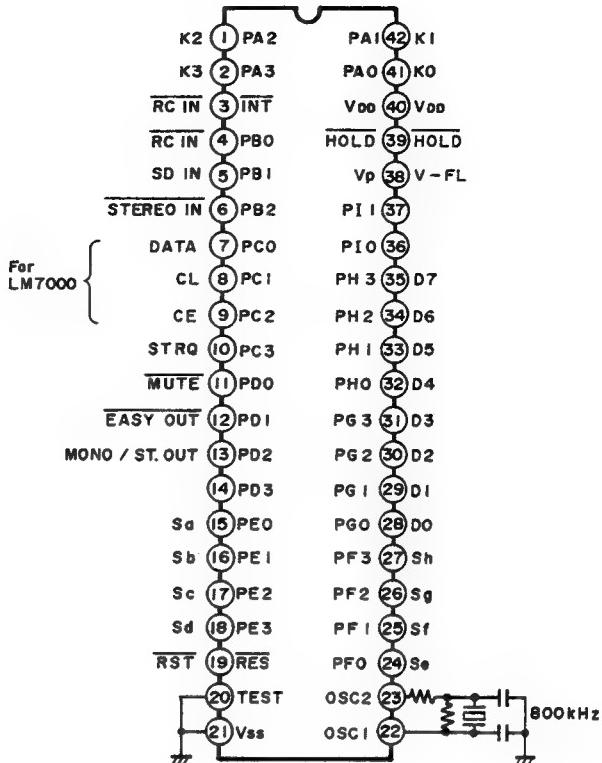
P4=173 kHz, P5=209 kHz, P6=272 kHz (LW only)

#### **SERVICE** (Service program start key)

When test points D6 and Ko on the P102 P.W. board are shorted, the following service program is started;

- 1) The muting signal is output.
- 2) First all displays on the fluorescent display turn off, then the segments light in order one at a time starting from the "a" segment for the fourth digit.
- 3) After the last segment lights, all segments remain lit for approximately 3 seconds, then the unit returns to the same status as before the service program was started.

#### Pin Connections Diagram



#### ● Description of Pins

**Sa – Sh:** Fluorescent display segment signals.

**Do – D7:** Fluorescent display digit signals and key return signals.  
D0 → Diode matrix return signal  
D1 → D6 → Key return signals  
D1 → D7 → Digit signals

**K0 – K3:** Key input, diode matrix input

**DATA**  
**CL**  
**CE** } Signals transferred to LM7000N

**R.C IN:** For inputting remote control signal.

**SD IN:** Stop signal input pin for auto tuning.  
For FM and MW, when the SD IN pin becomes high, "TUNED" lights on the fluorescent display, and if in the auto tuning mode, scanning stops.  
For LW, when the SD IN pin becomes high, the STRQ pin becomes high and the LM7000N performs IF counting. If the result is  $450 \text{ kHz} \pm 0.6 \text{ kHz}$ , ST IN becomes low, "TUNED" lights, and if in the auto tuning mode, scanning stops.

**ST RQ:** Signal for making LM7000N perform IF counting.  
For the LW band only, if the SD IN pin is high after the PLL data is changed, the ST RQ pin becomes high for approximately 180 ms.

**MUTE OUT:** Audio mute signal.

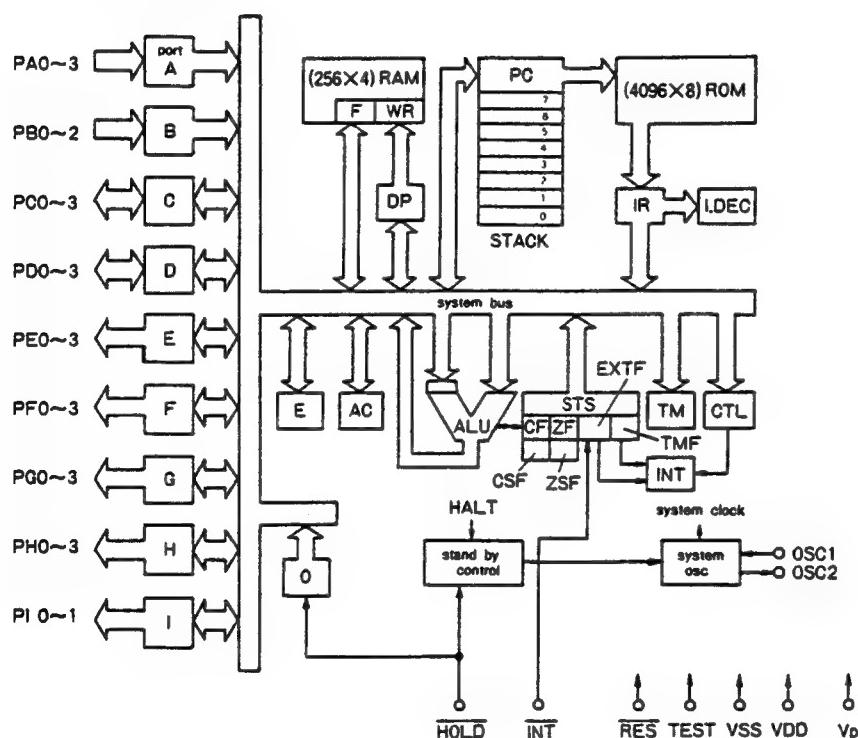
Output when the band is switched, preset frequencies are recalled, the power is turned on, etc. Low when active.

**EASY OUT:** Easy operation out signal.  
Outputs a 14-bit RC-5 code synchronized with the MUTE OUT output.

**MONO/ST. OUT:** Mode switch output.  
For FM, the output changes between low and high depending on the MODE key. When the output is high, "AUTO" lights on the fluorescent display, and when low, "AUTO" is not lit.

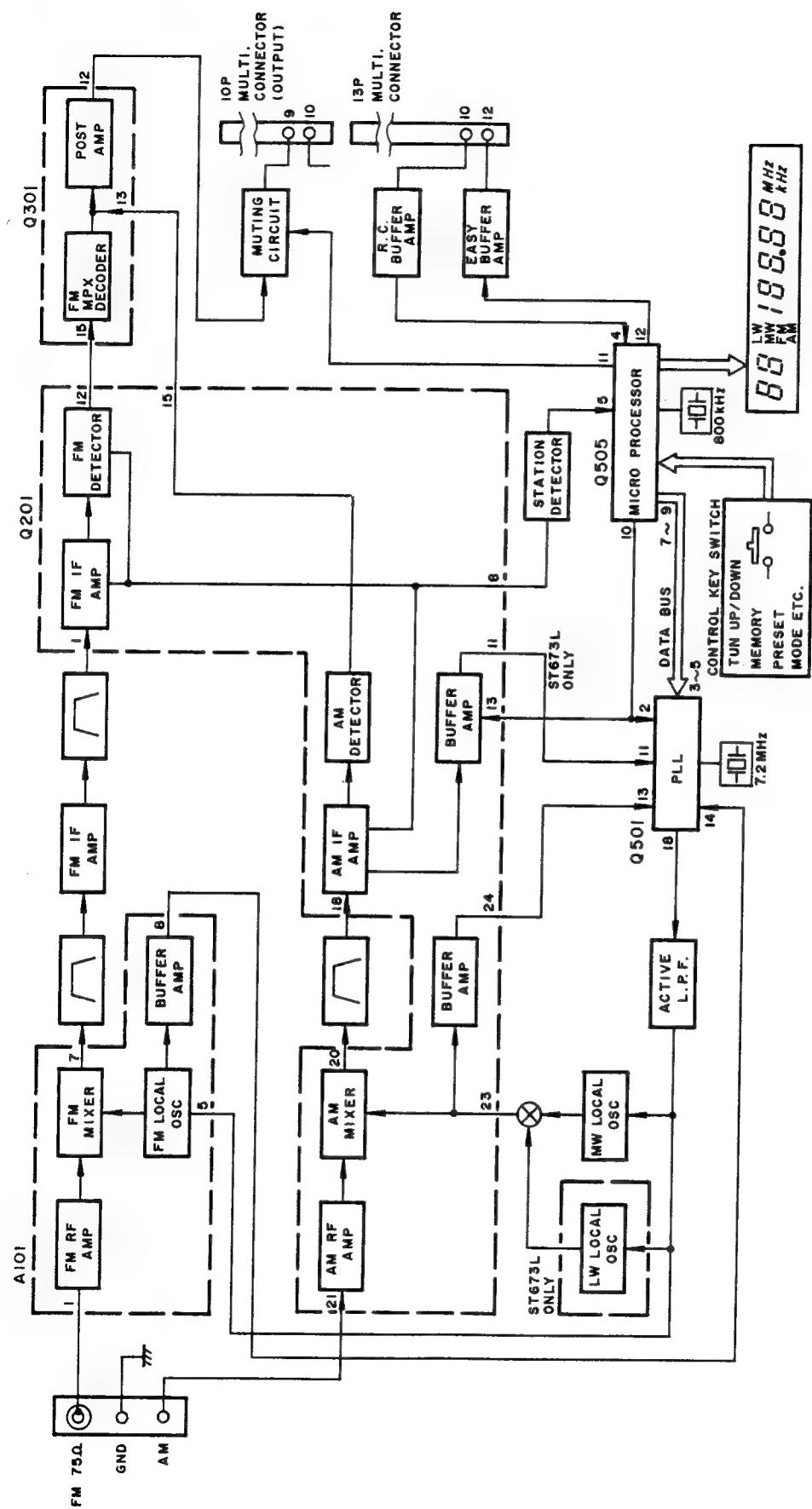
**STEREO IN:** Pin for lighting "STEREO" on fluorescent display.  
For FM, when this pin becomes low, "STEREO" lights only when "TUNED" is lit.

### System Block Diagram

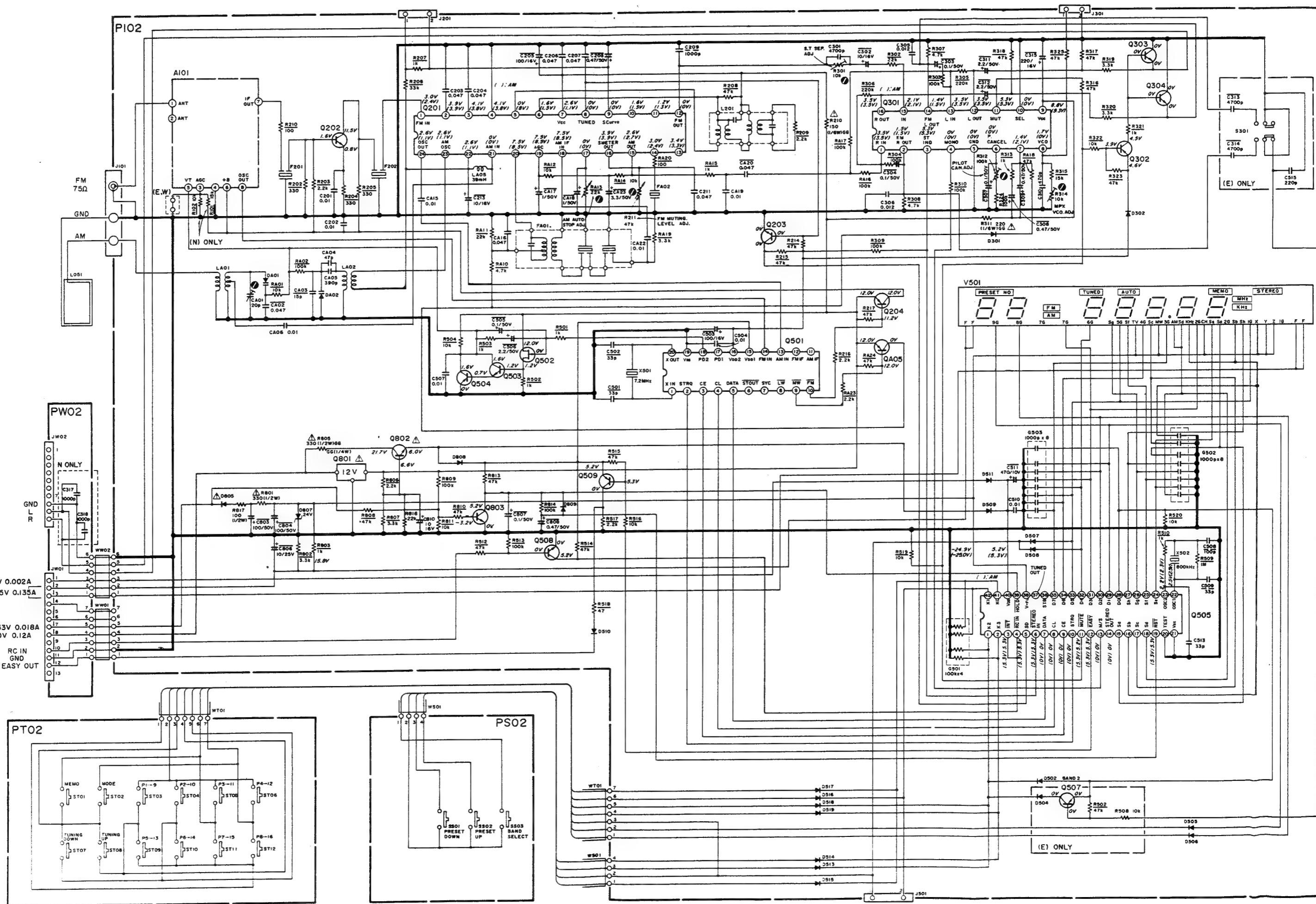


RAM:	Data Memory
F:	Flag
WR:	Working Resist
AC:	Accumulator
ALU:	Logic Operation unit
DP:	Data Pointer
E:	E Resister
CTL:	Control Resister
OSC:	OSC Circuit
TM:	Timer
STS:	Status Resister
ROM:	Program Memory
PC:	Program Counter
INT:	Interrupt Control
IR:	Inst. Resister
I. DEC:	Inst. Decoder
DF, CSF:	Carry Flag
ZF, ZSF:	Zero Flag

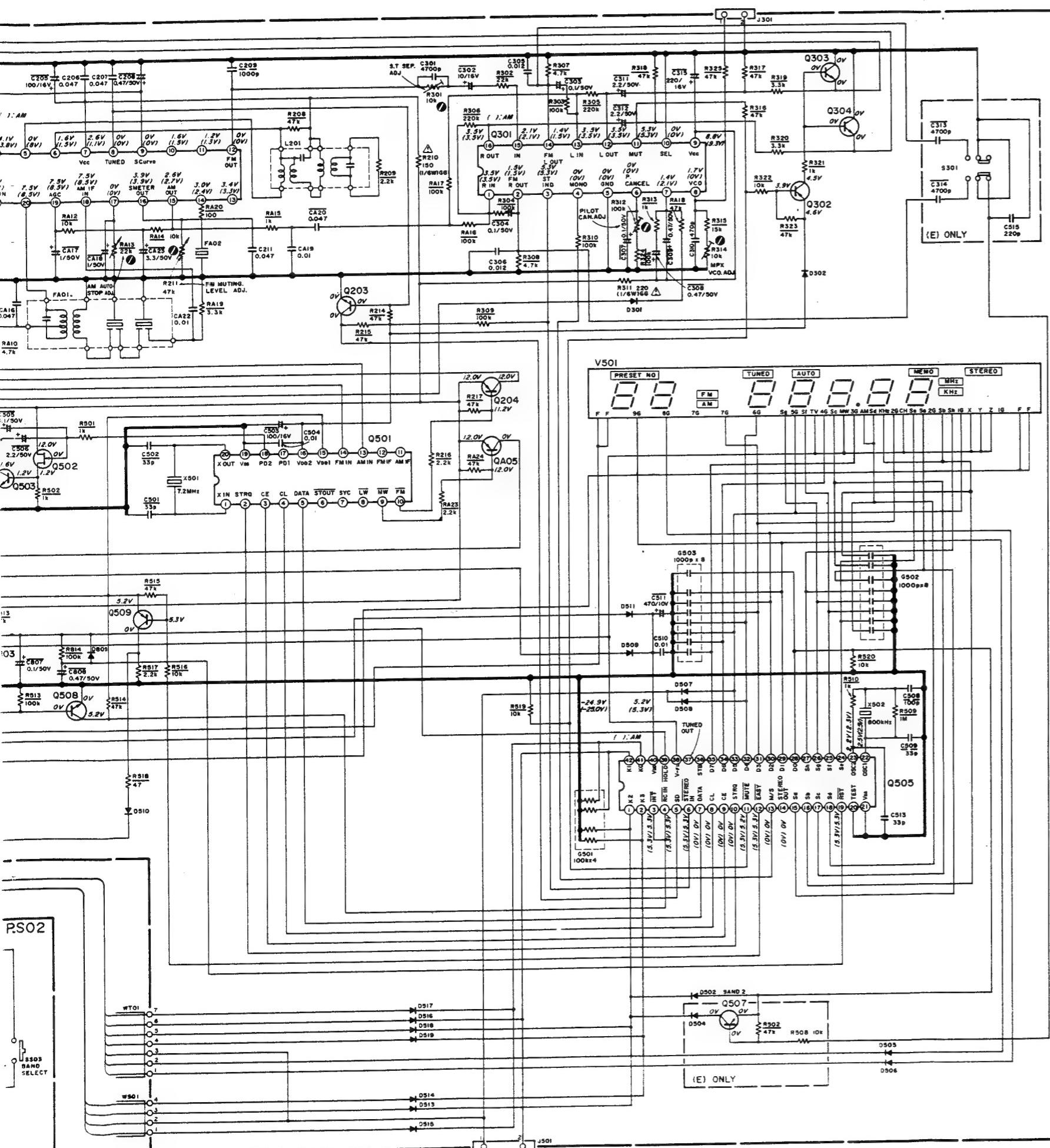
## 6. BLOCK DIAGRAM



## 7. SCHEMATIC DIAGRAM



# Model ST673



Q201  
LAI266 FM/AM IF

Q202  
2SCI047C

Q203,0303,0304,Q503  
Q504,Q508,Q803

2SC536SP(F,G)  
2SC2458(Y,GR)  
2SC3311A(Q,R)  
2SC1740SR(S)

Q204,0302  
Q507,Q509,QA05

2SA608SP(F,G)  
2SA1048(Y,GR)  
2SA1309A(Q,R)  
2SA933S(R,S)

Q301  
TEA5581 FM MPX

Q501  
LM7000N

Q502  
2SK30A

Q505  
LC6514B-3357

Q801  
NJM7812A

Q802  
2SD863E

D301,D302,D502,D504  
D505~D511,D513~D519

ISSI33,ISSI76,MA165,

D805,D808,D809

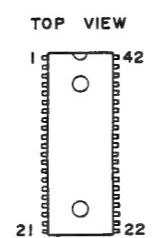
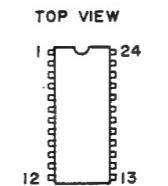
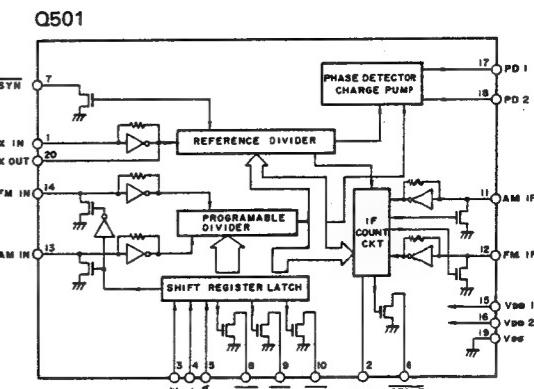
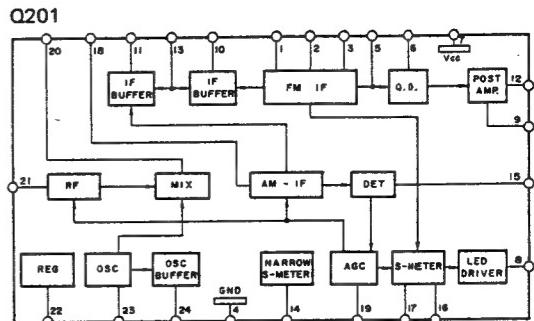
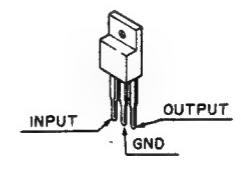
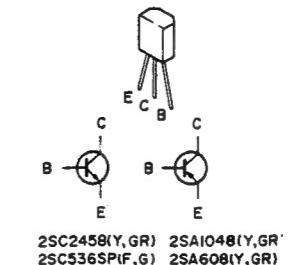
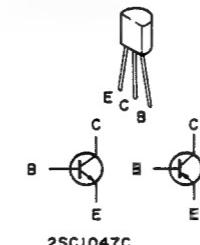
RL103E,DSFI0C

D807  
RD24JB2  
MTZJ24D

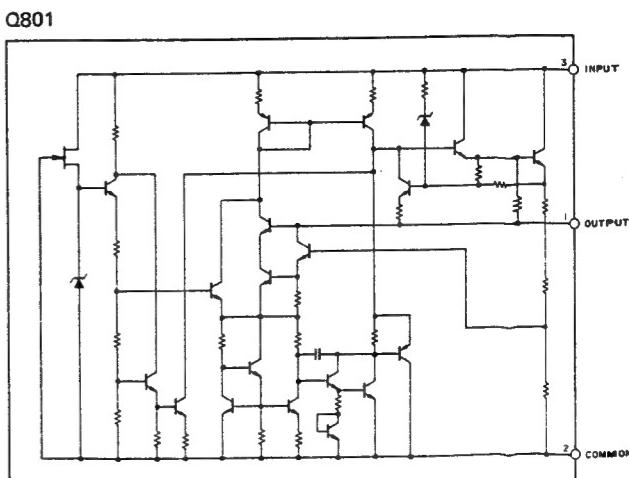
DAO1,DAO2

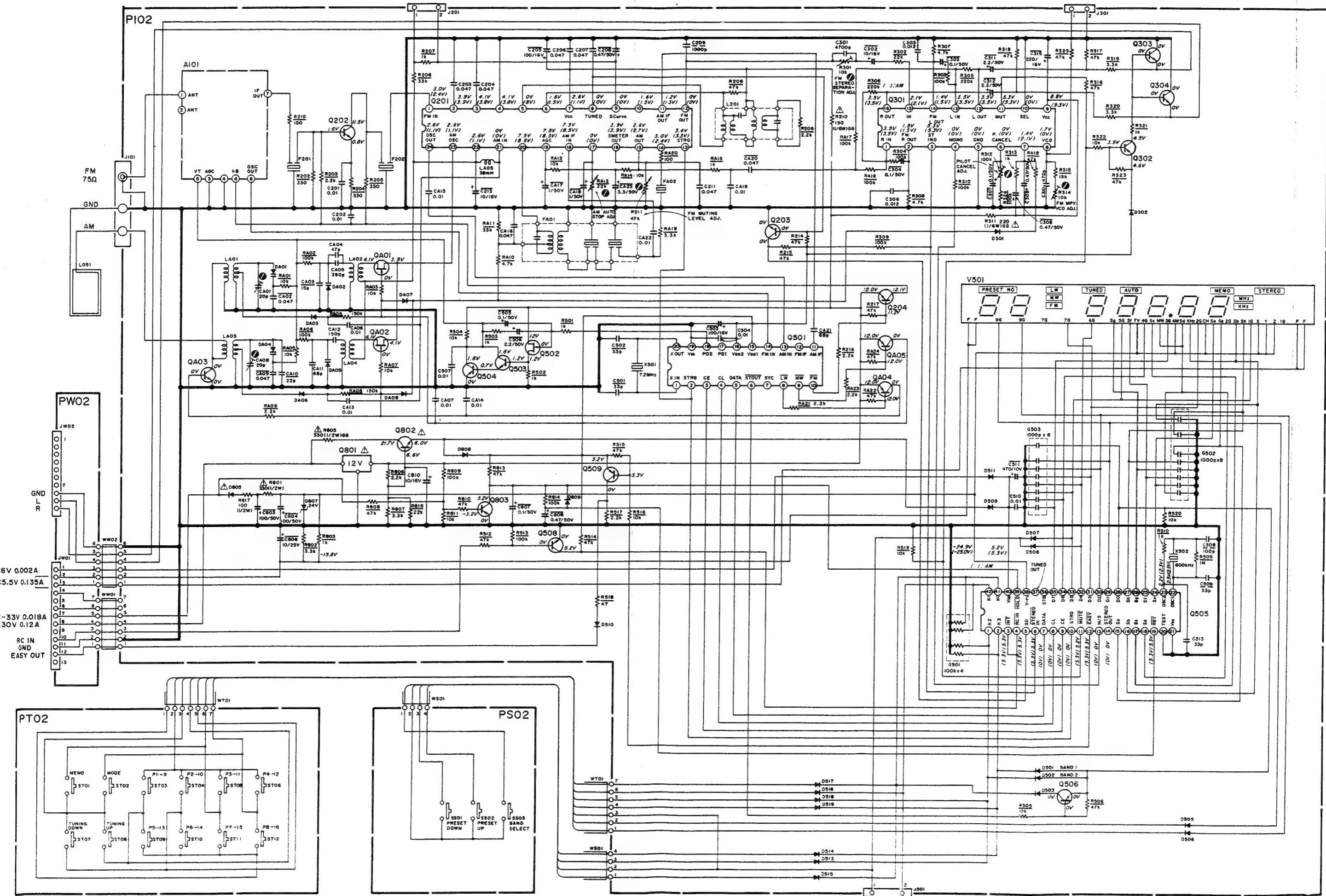
SVC321SP

	1	2	3	4	5	6	7	8	9	10
(1):AM	1.7V	OV	OV	OV	OV	OV	1.20V	1.20V	1.3V	
(1):LW	1.7V	OV	OV	OV	OV	OV	1.20V	1.3V	1.20V	
20	19	18	17	16	15	13	12	11		
(1):AM	1.7V	OV	OV	OV	5.3V	5.3V	3.1V	OV	1.0V	
(1):LW	1.7V	OV	OV	OV	5.3V	5.3V	3.1V	OV	1.0V	



LC6514B-3357



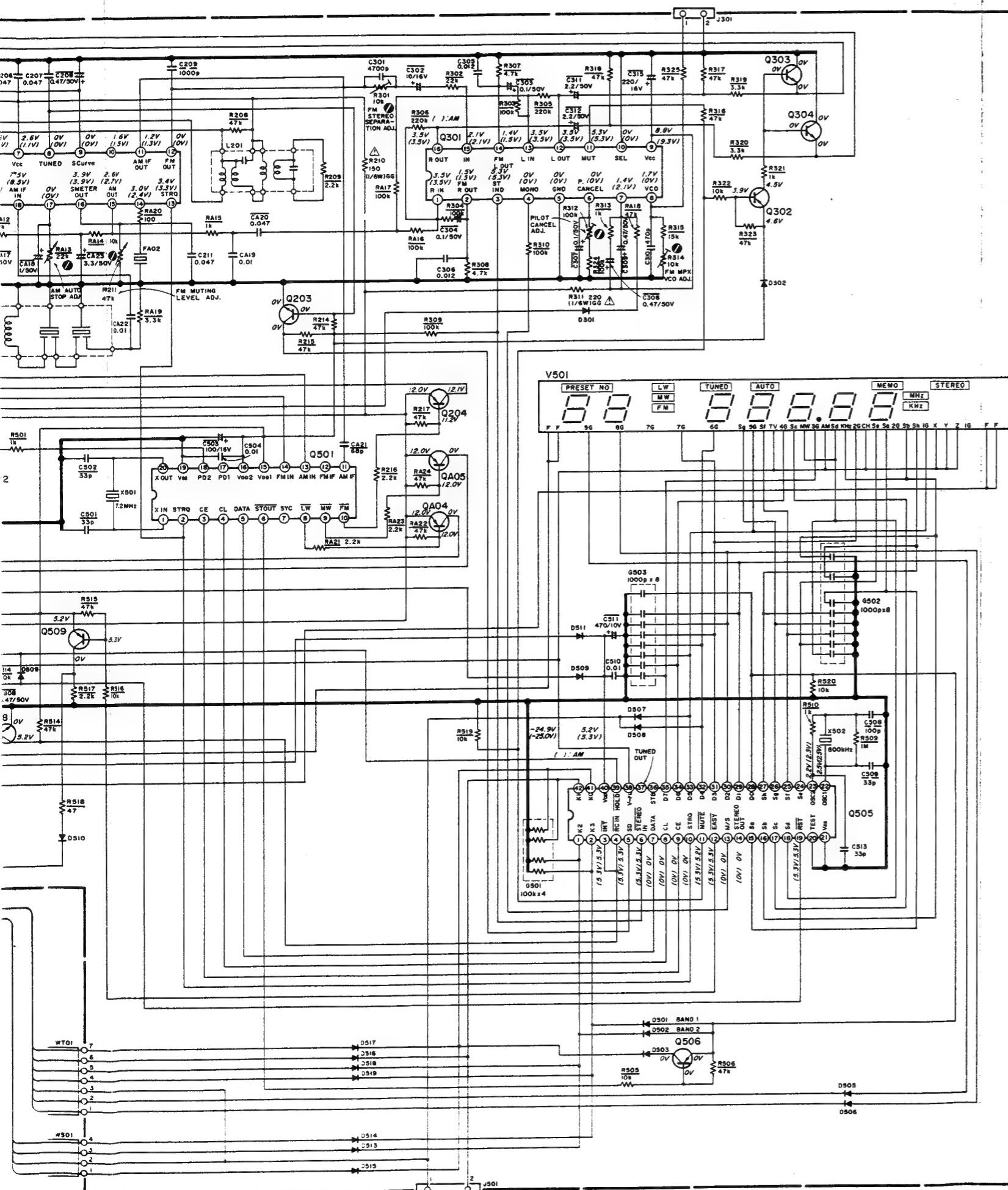


MZ 1718

57

58

# Model ST673L



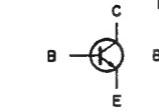
Q201

LAI266 FM/AM IF



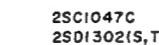
Q202

2SCI047C



Q203, Q303, Q304, Q503  
Q504, Q508, Q803

2SC536SP(F,G)  
2SC2458(Y,GR)  
2SC331A(Q,R)  
2SC1740S(S)



Q204, Q302, Q506  
Q509, QA04, QA05

2SA608SP(F,G)  
2SA1048(Y,GR)  
2SA1309A(Q,R)  
2SA933S(S)



Q301

TEA558I FM MPX



Q501

LM7000N



Q802

2SD863E



Q505

LC6514B-3357



TOP VIEW



Q801

NJM7812A



TOP VIEW



Q802

2SK30A(Y)



TOP VIEW



Q803

2SD1302(S,T)



TOP VIEW



Q501

LM7000N



TOP VIEW



Q801

LC6514B-3357

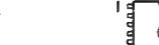


TOP VIEW



Q802

LC6514B-3357



TOP VIEW



Q803

TEA558I



TOP VIEW



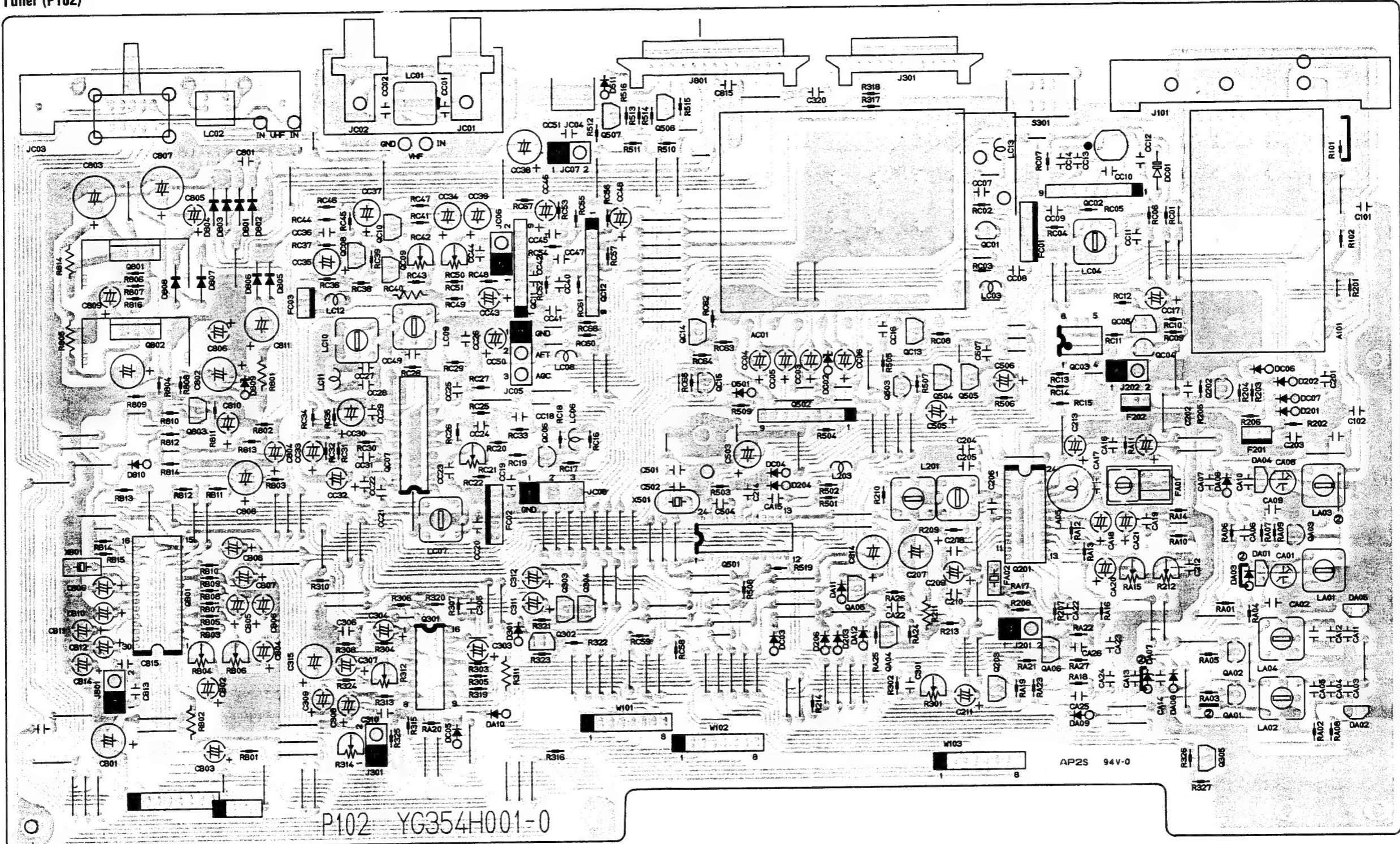
Q501

VOLTAGE

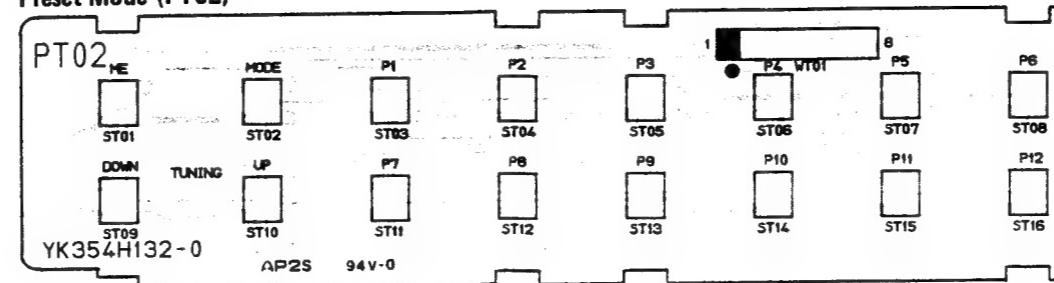
	1	2	3	4	5	6	7	8	9	10
1. AM	1.7V	OV	OV	OV	OV	OV	12.0V	12.0V	1.3V	
1. LW	1.7V	OV	OV	OV	OV	OV	1.3V	1.3V	1.2V	
2. 19	1.8	17	16	15	14	13	12	11		
2. 17	1.7V	OV	OV	3.2V	3.2V	3.1V	1.7V	1.7V	1.7V	
2. 16	1.7V	OV	OV	3.3V	3.3V	3.1V	1.7V	1.7V	1.7V	
2. 15	1.7V	OV	OV	3.3V	3.3V	3.1V	1.7V	1.7V	1.7V	
2. 14	1.7V	OV	OV	3.3V	3.3V	3.1V	1.7V	1.7V	1.7V	
2. 13	1.7V	OV	OV	3.3V	3.3V	3.1V	1.7V	1.7V	1.7V	

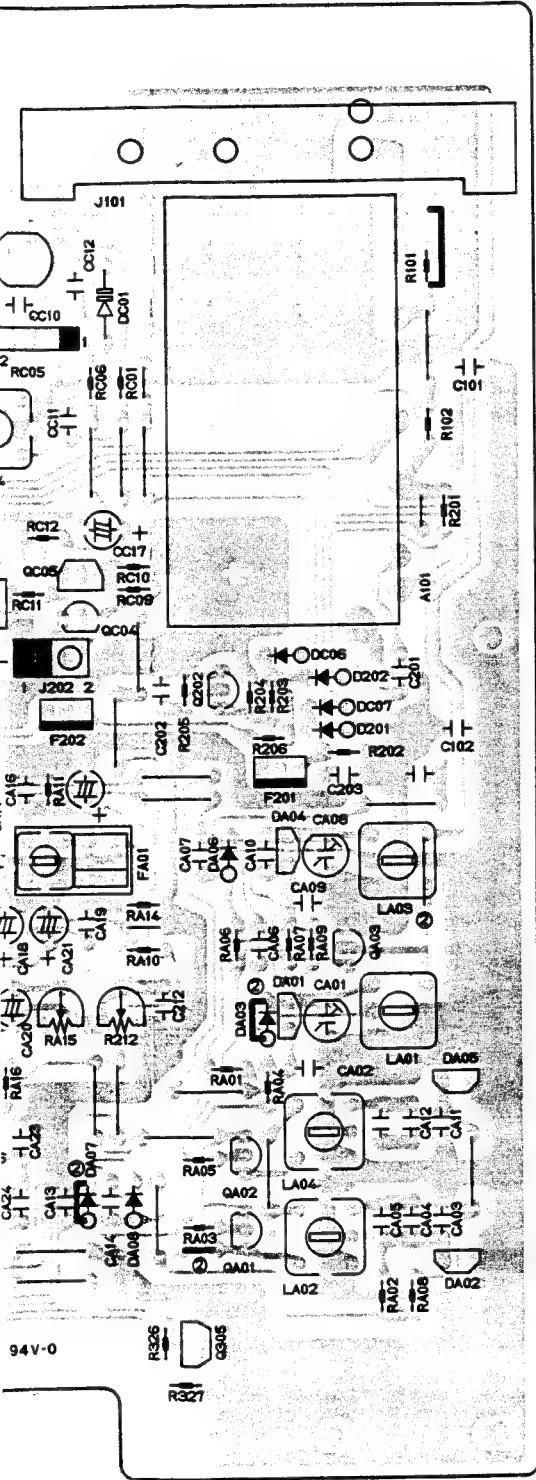
## **8. COMPONENT LOCATIONS**

## Tuner (P102)

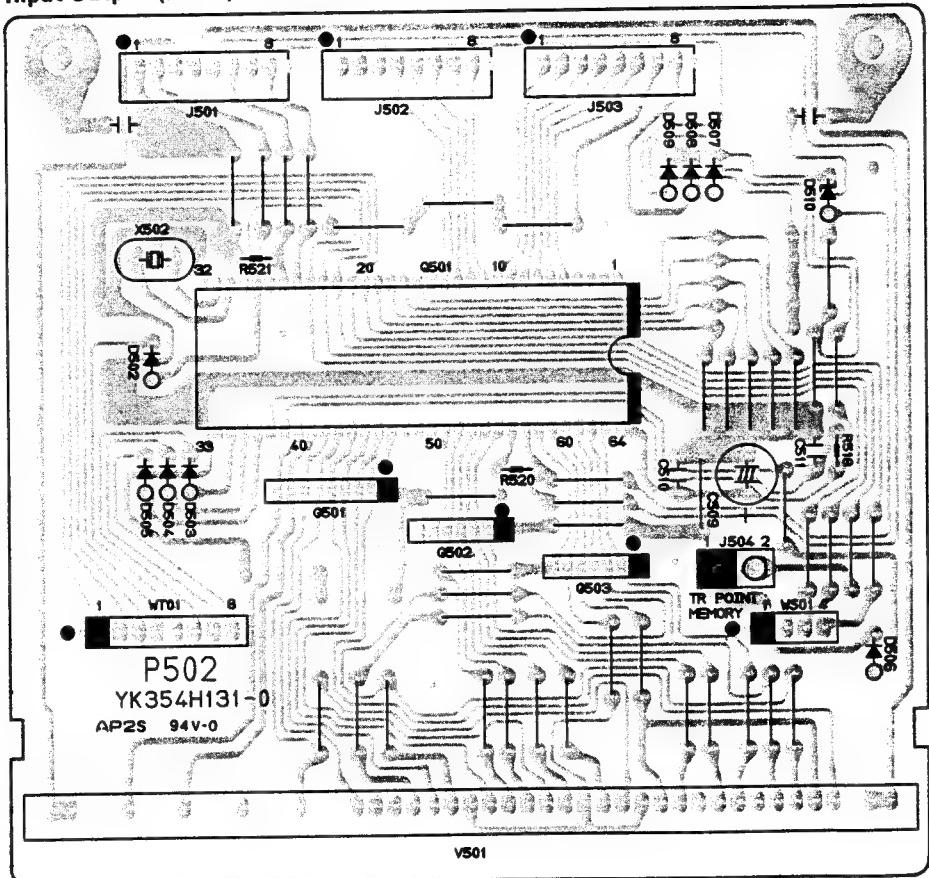


## Preset Mode (PT02)

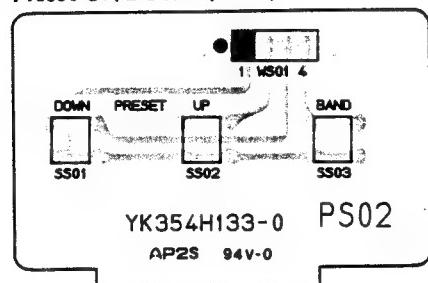




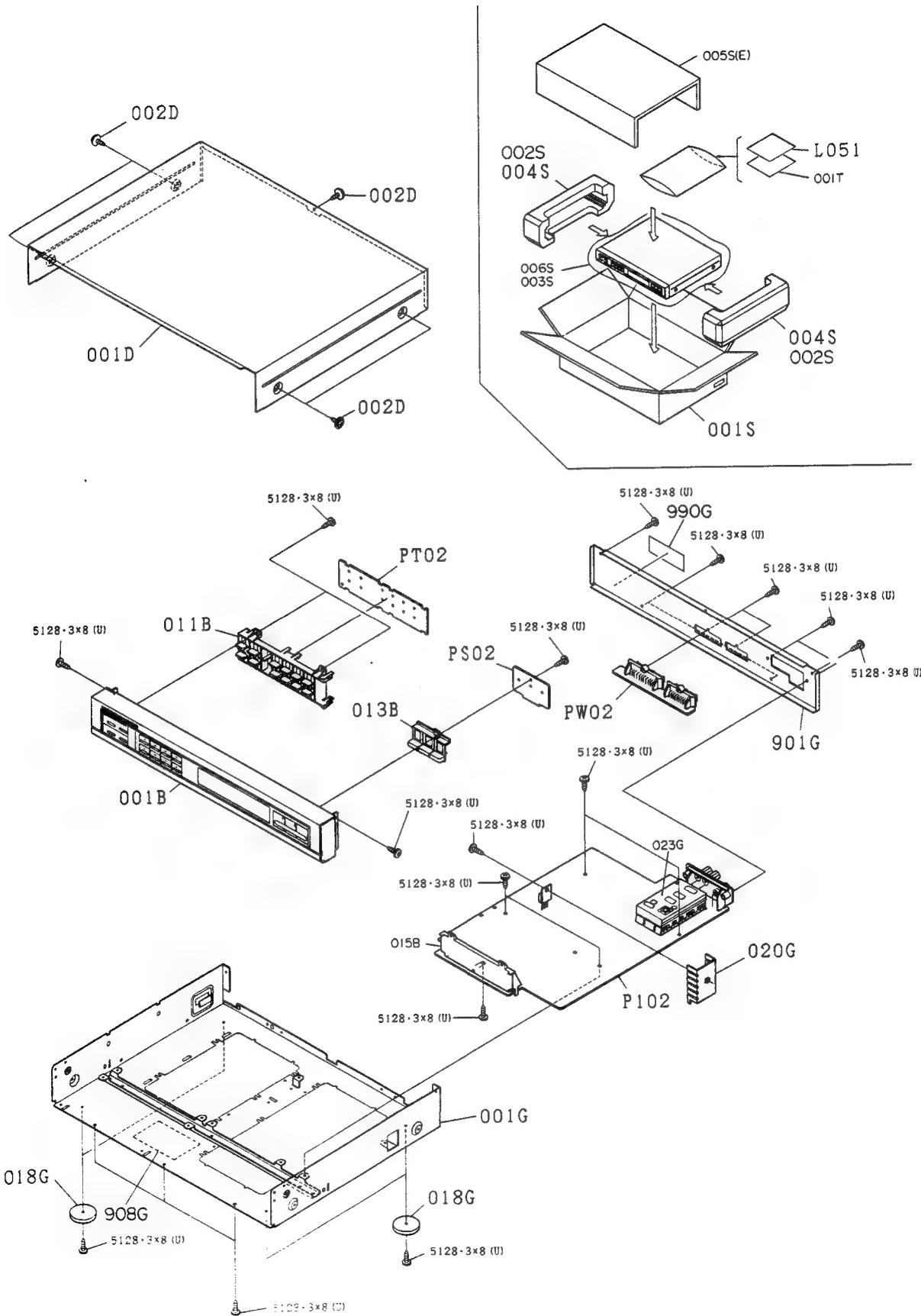
## **Input Output (PW02)**



#### **Preset UP/DOWN (PS02)**



## 9. EXPLODED VIEW AND PARTS LIST



REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 426 51189 4822 426 51208	Front Panel Assembly (ST673) Front Panel Assembly (ST673L)
011B	4822 410 25817	Button, Preset
013B	4822 410 25831	Button, Tuning Up/Down
001D	4822 426 40368	Lid, Top Cover
002D	4822 502 12355	B.T. Screw                    83 x 8
018G	4822 462 41143	Leg
020G	4822 255 40532	Heatsink
901G	4822 426 20135 4822 426 20136 4822 426 20117 4822 426 20149	Rear Panel (ST673) [N] Rear Panel (ST673) [E] Rear Panel (ST673) [W] Rear Panel (ST673L)
908G	4822 600 70229	Lebel, Caution
990G	4822 454 11873	Indicator, Made in Japan (ST673L)

REF. DESIG.	PART NO.	DESCRIPTION
001S	4822 600 70471	<b>PACKING</b>
002S	4822 600 70474	Packing Case (ST673) [N, W]
004S	4822 600 70474	Cushion (ST673L)
L051	4822 157 53089	Cushion (ST673)
		Antenna Coil, Loop

## 10. ELECTRICAL PARTS LIST

### ASSIGNMENT OF COMMON PARTS CODES.

#### RESISTOR

- R\*\*\*: (1) GD05---140, Carbon film fixed resistor,  $\pm 5\%$ , 1/4W  
 R\*\*\*: (2) GD05---160, Carbon film fixed resistor,  $\pm 5\%$ , 1/6W

① — Resistance value

#### Examples

① Resistance value

0.1Ω...001	10Ω...100	1kΩ...102	100kΩ...104
0.5Ω...005	18Ω...180	2.7kΩ...272	680kΩ...684
1Ω...010	100Ω...101	10kΩ...103	1MkΩ...105
6.8Ω...068	390Ω...391	22kΩ...223	4.7MkΩ...475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

#### C\*\*\*: CERAMIC CAP.

- (1) DD1---370, Ceramic condenser  
 Disc type  
 ①② Temp. coeff. P350 ~ N1000, 50V  


#### Examples

① Tolerance (Capacity deviation)

$\pm 0.25\text{pF}...0$   
 $\pm 0.5\text{pF}...1$   
 $\pm 5\%...5$

\* Tolerance of COMMON PARTS handled here are as follows:

0.5pF ~ 5pF... $\pm 0.25\text{pF}$   
 6pF ~ 10pF... $\pm 0.5\text{pF}$   
 12pF ~ 560pF... $\pm 5\%$

② Capacity value

0.5pF...005 3pF...030 100pF...101  
 1pF...010 10pF...100 220pF...221  
 1.5pF...015 47pF...470 560pF...561

#### C\*\*\*: CERAMIC CAP.

- (1) DK16---300, High dielectric constant ceramic condenser  
 Disc type  
 ① Temp. chara. 2B4, 50V  


#### Example

① Capacity value

100pF...101 1000pF...102 10000pF...103  
 470pF...471 2200pF...222

#### C\*\*\*: ELECTROLY CAP. ( $\frac{1}{2}$ ), FILM CAP. ( $\frac{1}{2}$ )

- (1) EA-----10, Electrolytic condenser  
 One-way lead type, Tolerance  $\pm 20\%$   
 ①②  


#### Examples

① Capacity value

0.1μF...104 4.7μF...475 100μF...107  
 0.33μF...334 10μF...106 330μF...337  
 1μF...105 22μF...226 1100μF...108  
 2200μF...228

② Working voltage

6.3V...006 25V...025  
 10V...010 35V...035  
 16V...016 50V...050

- (2) DF15---350, Plastic film condenser

One-way type, Mylar  $\pm 5\%$  50V  
 ①  


#### Examples

① Capacity value

0.001μF (1000pF)...102 0.1μF...104  
 0.0018μF.....182 0.56μF...564  
 0.01μF.....103 1μF...105  
 0.015μF.....153

REF. DESIG.	PART NO.	DESCRIPTION					
<b>P102-TUNER CIRCUIT BOARD</b>							
<b>P102-CAPACITORS</b>							
CA01	4822 125 60104	Trimming	20pF				
CA04	4822 122 31205	Ceramic	47pF	$\pm 5\%$			
CA05	4822 121 42466	Film	390pF	$\pm 5\%$			
CA06	4822 122 32486	Ceramic	0.01μF	+80% -20%			
CA07	4822 122 32486	Ceramic	0.01μF	+80% -20%			
CA08	4822 125 60104	Trimming	20pF (ST673L)				
CA12	4822 122 10367	Ceramic	150pF	$\pm 5\%$ (ST673L)			
CA13	4822 122 32486	Ceramic	0.01μF	+80% -20%			
CA14	4822 122 32486	Ceramic (ST673L)	0.01μF	+80% -20%			
CA15	4822 122 32486	Ceramic	0.01μF	+80% -20%			
CA16	4822 122 40306	Ceramic	0.047μF	+80% -20%			
CA19	4822 122 32486	Ceramic	0.01μF	+80% -20%			
CA22	4822 122 32486	Ceramic	0.01μF	+80% -20%			
C201	4822 122 32486	Ceramic	0.01μF	+80% -20%			
C202	4822 122 32486	Ceramic	0.01μF	+80% -20%			
C203	4822 122 40306	Ceramic	0.047μF	+80% -20%			
C204	4822 122 40306	Ceramic	0.047μF	+80% -20%			
C206	4822 122 40306	Ceramic	0.047μF	+80% -20%			
C207	4822 122 40306	Ceramic	0.047μF	+80% -20%			
C211	4822 122 40306	Ceramic	0.047μF	+80% -20%			
C310	4822 121 41626	Film	470pF	$\pm 5\%$			
C504	4822 122 32486	Ceramic	0.01μF	$\pm 5\%$			
C507	4822 122 32486	Ceramic	0.01μF	+80% -20%			
C510	4822 122 32486	Ceramic	0.01μF	+80% -20%			
C512	4822 122 32486	Ceramic	0.01μF	+80% -20%			
C801	4822 122 32827	Ceramic	4700pF	+80% -20%			
G502	4822 111 91393	Allay	1000pFx8				
G503	4822 111 91393	Allay	1000pFx8				
<b>P102-RESISTORS</b>							
RA13	4822 100 20545	22KΩ, Trimming					
R210	4822 111 91404	150Ω	$\pm 5\%$	1/6W			
R211	4822 100 11042	47KΩ	Trimming				
R301	4822 100 11041	10KΩ	Trimming				
R311	4822 111 91405	220Ω	$\pm 5\%$	1/6W			
R312	4822 100 20552	100KΩ	Trimming				
R314	4822 100 11041	10KΩ	Trimming				
R801	4822 116 52846	150Ω	$\pm 5\%$	1/6W			
R804	4822 111 90724	330Ω	$\pm 5\%$	1/6W			
G501	4822 111 91399	100KΩx4	$\pm 5\%$	1/6W, Allay			
<b>P102-SEMICONDUCTORS</b>							
DA01	4822 130 31542	Varicap	SVC321SP				
DA02	4822 130 31542	Varicap	SVC321SP				
DA03	4822 130 33697	Diode	1SS135 (ST673L)				
DA04	4822 130 31542	Varicap	SVC321SP (ST673L)				
DA05	4822 130 31542	Varicap	SVC321SP (ST673L)				
DA06	4822 130 33697	Diode	1SS135 (ST673L)				
DA07	4822 130 33305	Diode	1SS133, etc. (ST673L)				
DA08	4822 130 33305	Diode	1SS133, etc. (ST673L)				

REF. DESIG.	PART NO.	DESCRIPTION		REF. DESIG.	PART NO.	DESCRIPTION	
D301	4822 130 33305	Diode	1SS133, etc.	J101	4822 266 30298	Terminal, FM Pal	
D302	4822 130 33305	Diode	1SS133, etc.	J201	4822 265 10158	Plug, 2P	
D501	4822 130 33305	Diode	1SS133, etc. (ST673L)	J301	4822 265 10158	Plug, 2P	
D502	4822 130 33305	Diode	1SS133, etc. [N, W]	J501	4822 265 10158	Plug, 2P	
D503	4822 130 33305	Diode	1SS133, etc.	LA01	4822 157 52328	Antenna Coil, MW	
D504	4822 130 33305	Diode	1SS133, etc. (ST673) [E]	LA02	4822 157 52716	OSC Coil, MW	
D505	{	4822 130 33305	Diode	LA03	4822 157 52714	Antenna Coil, LW (ST673L)	
D511			1SS133, etc.	LA04	4822 157 52717	OSC Coil, LW (ST673L)	
D513	{	4822 130 33305	Diode	LA05	4822 152 20595	Choke Coil, 39mH	
D519			1SS133, etc.	L201	4822 157 52715	I.F.T. Coil, FM DET	
D801	{	4822 130 32508	Diode	S301	4822 277 20968	Slide Switch, Scan/Step (ST673) [E]	
D806			DSF10C, etc.	V501	4822 130 90433	Display Unit, FIP10TM8	
D807	4822 130 80116	Zener	24V	X501	4822 242 71219	Crystal, 7.2MHz	
D808	4822 130 33305	Diode	1SS133, etc.	X502	4822 242 71405	Ceramic Vibrator, CSB800K	
D809	4822 130 33305	Diode	1SS133, etc.				
QA01	4822 130 42121	F.E.T.	2SK30A(Y) (ST673L)				<b>PS02-PRESET UP/DOWN CIRCUIT BOARD</b>
QA02	4822 130 42121	F.E.T.	2SK30A(Y) (ST673L)	SS01	4822 276 11559	Push Switch, Preset Up	
QA03	4822 130 42125	Transistor	2SD1302(S, T) (ST673L)	SS02	4822 276 11559	Push Switch, Preset Down	
QA04	4822 130 42715	Transistor (ST673L)	2SA608SP(F, G)	SS03	4822 276 11559	Push Switch, Band	
QA05	4822 130 42715	Transistor	2SA608SP(F, G)	WS01	4822 323 10111	Jumper Lead, 4P	
Q201	4822 209 71785	IC	LA1266				<b>PT02-PRESET MODE CIRCUIT BOARD</b>
Q202	4822 130 42082	Transistor	2SC1047(C)	ST01			
Q203	4822 130 42483	Transistor	2SC536SP(F, G), etc.	{	4822 276 11559	Push Switch, Preset Mode	
Q204	4822 130 42715	Transistor	2SA608SP(F, G), etc.	ST12			
Q301	4822 209 71776	IC	TEA5581				
Q302	4822 130 42715	Transistor	2SA608SP(F, G), etc.	WT01	4822 323 10059	Jumper Lead, 7P	
Q303	4822 130 42483	Transistor	2SC536SP(F, G), etc.				<b>PW02-INPUT/OUTPUT CIRCUIT BOARD</b>
Q304	4822 130 42483	Transistor	2SC536SP(F, G), etc.	JW01	4822 266 30306	Terminal, 13P	
Q501	4822 209 83314	IC	LM7000N	JW02	4822 266 30305	Terminal, 10P	
Q502	4822 130 42121	F.E.T.	2SK30A(Y)				
Q503	4822 130 42483	Transistor	2SC536SP(F, G), etc.	WW01	4822 323 10157	Jumper Lead, 7P	
Q504	4822 130 42483	Transistor	2SC536SP(F, G), etc.	WW02	4822 323 10096	Jumper Lead, 6P	
Q505	4822 209 71788	Microprocessor	LC6514B-3357				
Q506	4822 130 42715	Transistor	2SA608SP(F, G), etc. (ST673L)				
Q507	4822 130 42715	Transistor	2SA608SP(F, G), etc. (ST673) [E]				
Q508	4822 130 42483	Transistor	2SC536SP(F, G), etc.				
Q509	4822 130 42715	Transistor	2SA608SP(F, G), etc.				
Q801	4822 209 70084	IC	NJM7812A				
Q802	4822 130 60173	Transistor	2SC2060(Q, R)				
Q803	4822 130 42483	Transistor	2SC536SP(F, G), etc.				
A101	4822 210 10246	<b>P102-MISCELLANEOUS</b>					
		V.H.F. Tuner, FE306-A14 (ST673) [E W]					
	4822 210 10267	V.H.F. Tuner, FE307-G44 (ST673)[N]					
	4822 210 10246	V.H.F. Tuner, FE306-A14 (ST673L)					
FA01	4822 242 71509	Ceramic Filter, SFL450J3					
FA02	4822 242 71217	Ceramic Filter, BFU450C					
F201	4822 242 71135	Ceramic Filter, SFE10.7MS3-A [N, W]					
	4822 242 70911	Ceramic Filter, SFE10.7MA8-A (ST673) [E]					
F202	4822 242 71135	Ceramic Filter, SFE10.7MS3-A					

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

## DECK SECTION

### 1. P.W. BOARDS

As can be seen from the circuit diagram, the chassis of your Cassette Deck consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. Dolby B/C . . . . . mounted on P.W. Board P603
2. Audio . . . . . mounted on P.W. Board PJ03
3. NR Switch/  
Mix Mic Amp. . . . . mounted on P.W. Board PJ23
4. Wire Connect . . . . . mounted on P.W. Board PS03
5. Key Switch QMS/  
Memory . . . . . mounted on P.W. Board PS13
6. Key Switch Dubb./  
Continuos . . . . . mounted on P.W. Board PS23
7. Logic . . . . . mounted on P.W. Board PU03
8. Multi Connection . . . mounted on P.W. Board PU53
9. Regulator . . . . . mounted on P.W. Board PU73
10. Key Switch LED  
Indicator . . . . . mounted on P.W. Board PY03
11. Cassette LED M-1 . . . mounted on P.W. Board PY13
12. Cassette LED M-2 . . . mounted on P.W. Board PY23
13. Connect . . . . . mounted on P.W. Board PY33

### 2. TEST EQUIPMENT REQUIRED FOR SERVICING

For measuring or checking your Cassette Deck, the following instruments and materials are necessary.

- VTVM
- Audio Oscillator (AF OSC)
- Attenuator (600 Ω)
- Oscilloscope
- Bandpass Filter (1 kHz)
- IEC A-Curve Filter
- Wow and Flutter Meter
- Torque Meter (Cassette Type)
- Digital Frequency Counter
- Distortion Meter
- Black Tapes (Completely erased with bulk eraser)  
TDK AC-212 (Normal)  
TDK AC-512 (Special/CrO<sub>2</sub>)  
TDK AC-712 (Metal)

#### NOTE:

If any doubt is noted in a measured value, use new tape.

- Test tape (New Tape)  
TCC-111•MTT-111 Wow and Flutter, Tape Speed  
TCC-140•MTT-112B Signal-toNoise Ratio  
TCC-130•MTT-150 Level Adjustment  
TCC-161•MTT-256 Frequency Response (for Normal)  
TCC-261•MTT-356 Frequency Response (for CrO<sub>2</sub> and Metal)  
TCC-192•MTT-121 Cross Talk  
TCC-194•MTT-141 Channel Separation  
TCC-120 MTT-212 Output  
(A-BEX)•(TEAC)

### 3. OPERATIONAL DESCRIPTIONS OF AUDIO AND PERIPHERAL CIRCUITS

#### 3.1 Playback Equalizer Amp and Bias Oscillator IC TDA1600

##### 3.1.1 Built-in circuit of IC and features (Refer to Fig. 1)

- (1) PB EQ amp: Playback equalizer circuit including rec/play head switching and 120  $\mu$ /70  $\mu$ sec time constant switching circuits.
- (2) Bias OSC: Tape bias oscillator circuit including CrO<sub>2</sub>/Metal indication switching circuit and Normal/CrO<sub>2</sub>/Metal shift function.

##### 3.1.2 Block diagram

Figure 1 shows the block diagram incorporating TDA1600.

- (1) Each switching operation is performed by an electronic switching method and the input conditions are as follows:  
Pin ⑩ Tape Selector: (Normal) V+, (CrO<sub>2</sub>) V/2, (Metal) V-,  
Pin ⑪ Rec/Play: (Play) V-, (Rec) V+
- (2) This IC operates as a DC 15 V single power supply, however, since the audio circuit ground is fixed at 1/2 V, it functions as a  $\pm 7.5$  V dual-power supply externally.

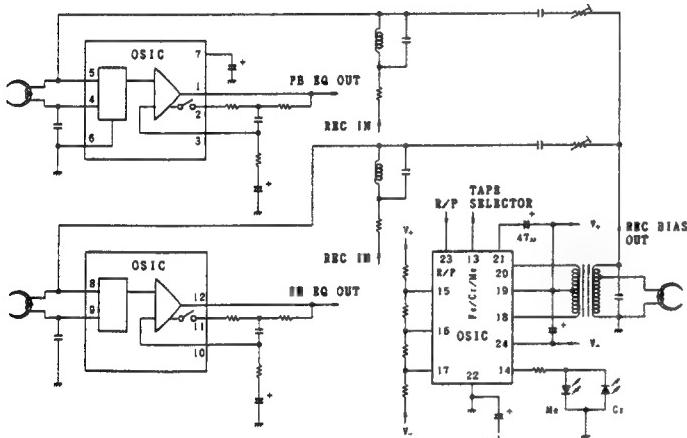
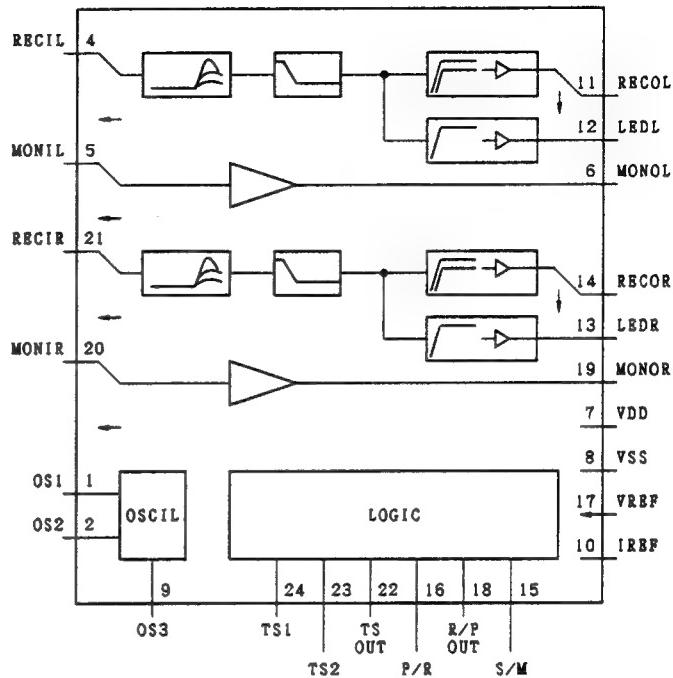


Figure 1

#### 3.2 Recording Equalizer Amp IC TDD1601

##### 3.2.1 Built-in circuit of IC and features

Figure 2 shows the internal construction of IC and pin connections.



PIN	SIGNAL	DEFINITION
1	OS1	Oscillator input
2	OS2	Oscillator output
3	N.C.	
4	RECIL	Recording path input left channel
5	MONIL	Monitor path input left channel
6	MOXOL	Monitor path output left channel
7	VDD	Highest power supply
8	VSS	Lowest power supply
9	OS3	Oscillator control
10	IREF	Current adjustment
11	RECOL	Recording path output left channel
12	LEDL	Ledbar output left channel
13	LEDR	Ledbar output right channel
14	RECOR	Recording path output right channel
15	S/M	Signal/mute input
16	P/R	Playback/record selection input
17	VREF	AC ground
18	R/P OUT	Record/playback selection output
19	MONOR	Monitor path output right channel
20	MONIR	Monitor path input right channel
21	RECIR	Recording path input right channel
22	TS OUT	Tape selection output
23	TS2	Tape selection input 2
24	TS1	Tape selection input 1

Figure 2

- (1) **Rec EQ Amp:** Recording equalizer amp using the switched capacitor method, and its compensation levels conform to IEC standard tapes. The peak frequency is determined by the clock frequency and shifted to each tape type programmably.

	Normal (500kHz)	High-Speed (500kHz) Dubbing (OS3" H")
Normal	17.5kHz	34.0kHz
CrO <sub>2</sub>	18.5kHz	36.0kHz
Metal	19.5kHz	40.0kHz

(Table 1)

- (2) **Monitor Path:** By passing through this IC as a line output path, pop noise on Rec/play switching will be reduced.

- (3) **Electrical Switching:** Rec/play and Tape Selector switching signals are output for IC internal switching and the switching between two TDA1600s, by each Rec/play, Tape Selector and Play Back Mute input. The input signals correspond to V- to V- +5 V for mechanism logic, and output signals are shifted to V- to V+ level to perform electronic switching.

### 3.2.2 Circuit configuration (Block diagram)

Figure 3 shows the simplified block diagram of TDA1600, TDD1601 and TEA0665 (Dolby NR IC).

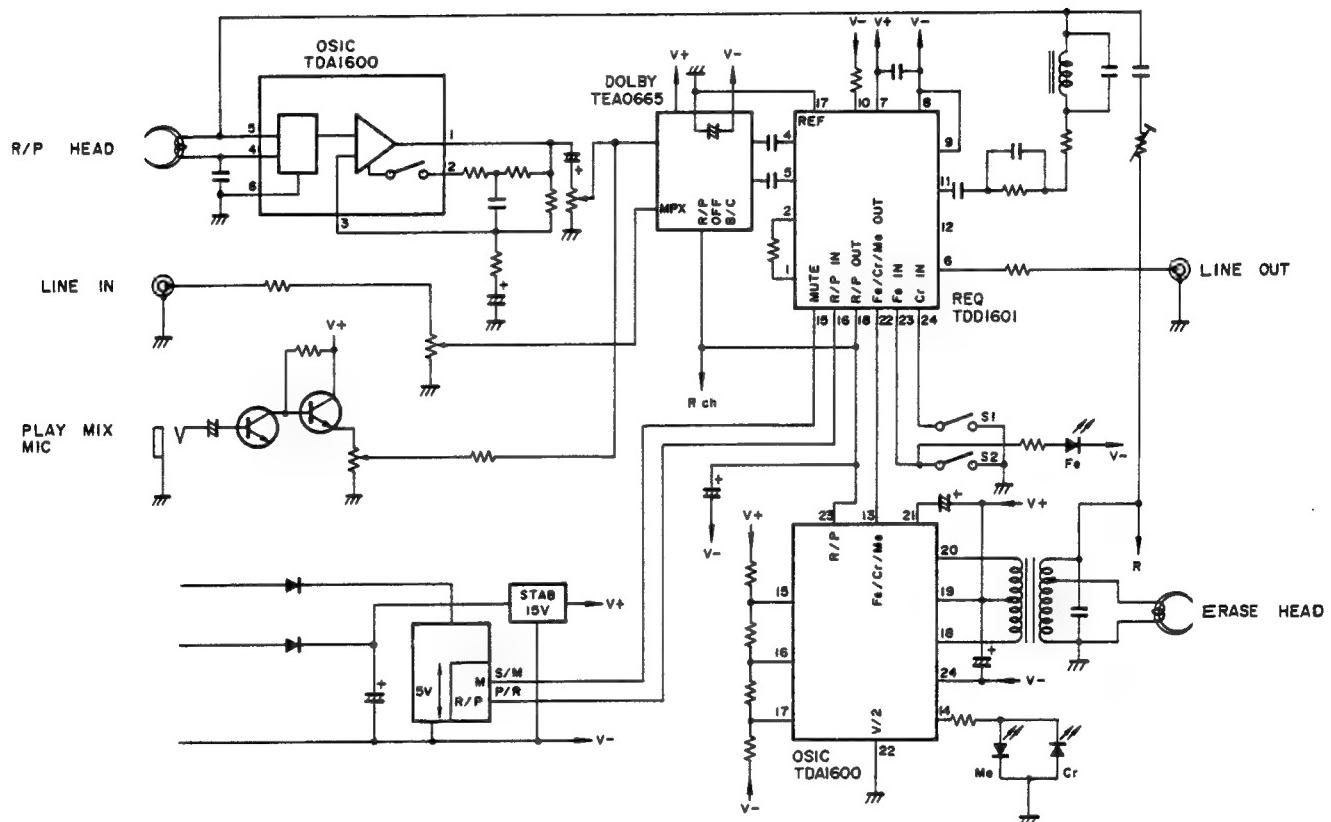


Figure 3

## 4. OPERATIONAL DESCRIPTION OF MICROPROCESSOR AND ITS PERIPHERAL CIRCUITS

### 4.1 Mechanism of This Unit

The rotational energy of the flywheel operates the head chassis movement, head rotation, braking, etc. A plunger is used to eliminate flywheel energy, so, when the mechanism is switched, pulse voltage is applied to the capstan motor and plunger.

### 4.2 Initial check

With a tape loaded in the cassette holder, set the Power switch to ON and check the following operations.

- (1) The display in reverse mode is "  ". The display is switched from "  ", "  " and back to "  " each time the REV. MODE selector button is pressed.
- (2) The tape running direction indicator, forward play or reverse play, depends on the tape running direction before the power was last switched off.

(3) The operation buttons become operable 4 seconds after the power is switched on.

a) When a cassette tape is loaded in the cassette holder, the tape running direction indicator flashes, then lights 4 seconds later.

b) When a cassette tape is not loaded in the cassette holder, the tape running indicator lights 4 seconds later.

(4) When the mechanism is not in the stop mode, turning the power switch on resumes the stop mode.

### 4.3 Microprocessor Operational Check

#### 4.3.1 VDD, INT, RES power ON/OFF condition

Figure 5 shows the leading and trailing characteristics of each VDD, INT and RES pin of the feature control microprocessor (QU01), mechanism control microprocessor (QU11, QU31), and figure 4 shows its diagram. Each timing is important for the normal function of the microprocessors.

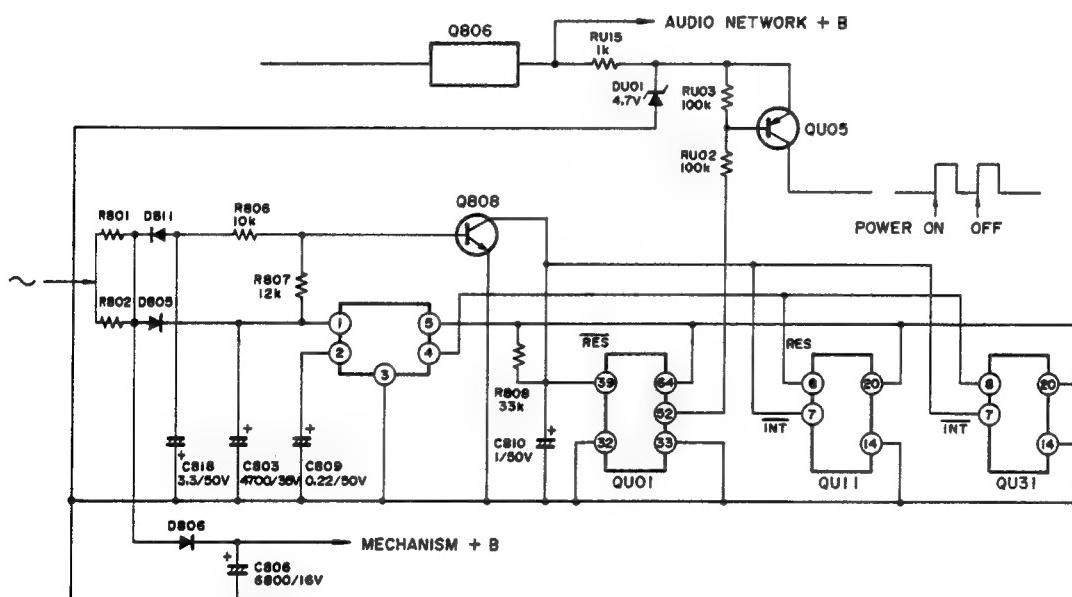


Figure 4

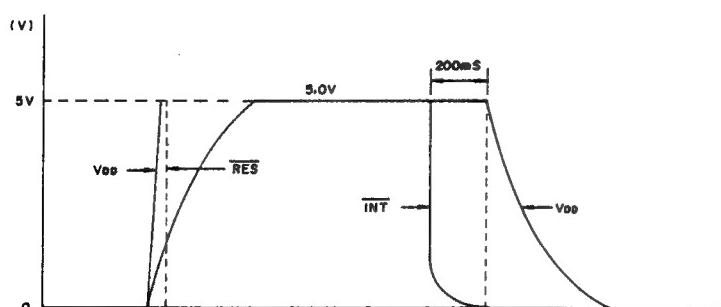


Figure 5

#### 4.3.2 Operational description of each section

##### (1) Q807: Regulator with reset function

L37MR05 RESET OPERATION  $C_d = 0.1 \mu F$

The microprocessor RES input is set so the signal is applied slightly after the rising of VDD (power ON), and slightly before the trailing time (power OFF). This time lag is determined by C809 connected to IC pin②. Figure 7 shows the timing diagram.

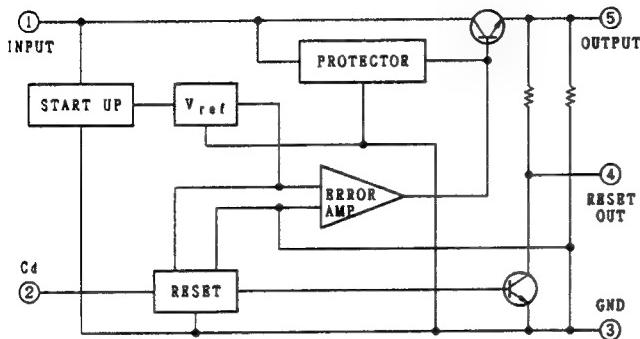


Figure 6

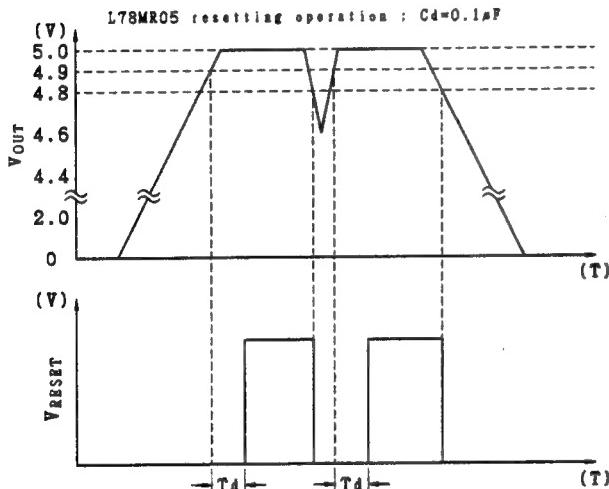


Figure 7

##### (2) R801, D805, C803

Used for VDD back up in the microprocessor; backs up the microprocessor for the time required to return the mechanism to the initial condition (stop mode) when the power is turned off.

##### (3) R802, D806, C806

Used for the power back up of the mechanism. Backs up the solenoids and capstan motor for the time required to return the mechanism to the initial condition (stop mode) when the power is turned off.

##### (4) C810, C818, D811, Q808, R806 ~ R808

Generates signals for the feature microprocessor RES and mechanism microprocessor INT. The feature microprocessor RES goes high from low after the mechanism microprocessor has been set. The stop condition on turning the power off is set at the mechanism microprocessor INT pin, and the stop operation is activated when it goes low from high. To obtain the fast trailing characteristic on power off, the charged energy of the ripple filter C808 is discharged via R803.

##### (5) RU03, RU02, QU05

Outputs the audio mute signal when the power is turned on/off. When transistor QU05 turns on, the QU01 output turns these on immediately to reduce pop noise.

#### 4.3.3 Feature microprocessor and mechanism microprocessor

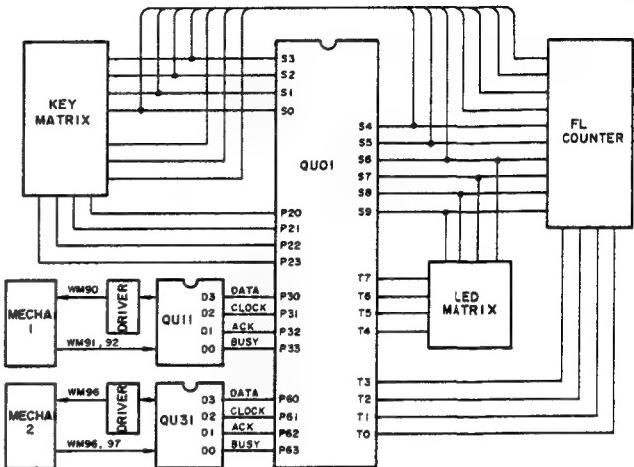


Figure 8

- Transmission/reception of feature microprocessor and mechanism microprocessor. Bidirectional transmitting/receiving is performed with 4 I/O lines.
- When the RES pin of feature microprocessor goes high from low, RES command is output to the mechanism microprocessor via DATA line.
- Mechanism microprocessor has the function to control mechanism and to judge the interval between tunes when searching.

#### 4.3.4 Key matrix

	④ S0	③ S1	② S2	① S3	⑥ S4	⑦ S5	⑧ S6
⑫ P20	—	—	—	—	Counter Res	Blank Skip	—
⑭ P21	—	Memory	Hi-speed Dubbing	Normal Dubbing	—	Pause	Stop
⑮ P22	—	QMS	Deck B	Continuos Play	Rec Mute	F.F	Rew
⑯ P23	—	Reverse Mode	Deck A	—	Rec	Fad Play	Rev Play

#### 4.3.5 Initialization

Turn the power switch on.

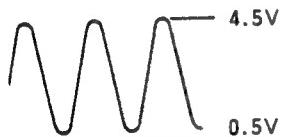
- (1) When the RES signal from QU01, QU11, QU31 rises the capstan motor rotates to return the head chassis to the stop position, if it is not in the stop mode.
- (2) When the head chassis is already in the stop position, or 4 seconds after the head chassis has been returned to the stop position, the tape running direction indicator lights.
- (3) When the tape running direction indicator lights, the microprocessors begin accepting the timer-play, timer-rec and each operation key.

#### Check points on abnormal initialization

- ★ When operation (1) does not function (when head chassis is not in the stop position):

- a) Check the waveform of QU11 pin ⑥.

Pin ⑥



- b) Check the rising characteristics of VDD, INT and RES. When they go high with the rising characteristics shown in Fig. 5, they are normal.
  - c) When the head is not returned to the stop position, check the motor drive circuit and its vicinity.
- ★ When operation (2) does not function:

- a) When the tape running direction indicator is not lit, check the display PC board and surrounding wiring, etc. When the indicator does not blink after four seconds with the tape loaded, check that QU11, QU31 pin ⑩ is low with the tape loaded. (When the power is turned on, the initial condition of the mechanism is transmitted to the feature microprocessor.)
  - b) When the forward direction indicator (▷) lights in spite of the head being in the reverse direction, check the wiring of FWD/REV switch, etc.
- QU11, QU31 pin ⑩ is low when in reverse mode.

- ★ When operation (3) does not function:

- a) Key operation does not function:  
When more than two keys are pressed causing switch binding on the mechanism control key switch PC board, the key operations are not accepted.
- b) When the cassette-in switch of the mechanism is not set ON, check the switch condition and wiring, etc.

## 5. MOTOR DRIVE CIRCUIT

### 5.1 F/R Motor Drive Circuit

The direction of F/R motor rotation is determined by the output from pins ⑬ ⑭ of QU11/31, and the winding torques in PLAY and FF/REW modes are switched by pin ⑮ of QU11/31.

The Output according to the pin operating condition is shown below.

QU11/31 PIN NO.	STOP	FF	REW	FORWARD PLAY	REVERSE PLAY
⑯	L	H	L	H	L
⑰	L	L	H	L	H
⑮	H	H	H	L	L

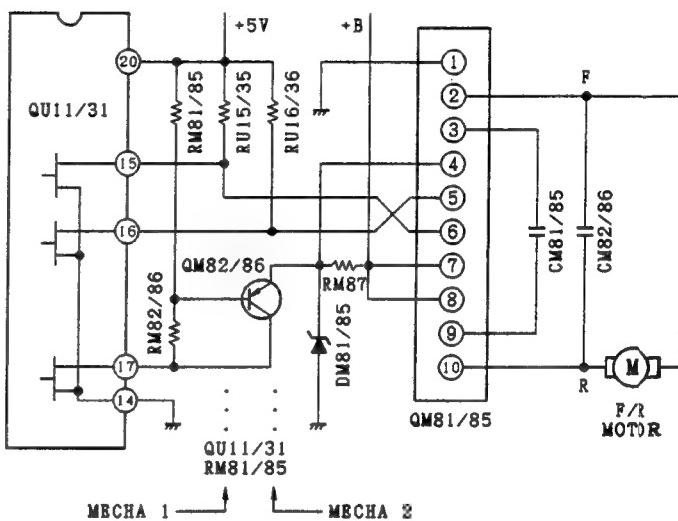


Figure 9

### 5.2 Capstan Motor Drive Circuit

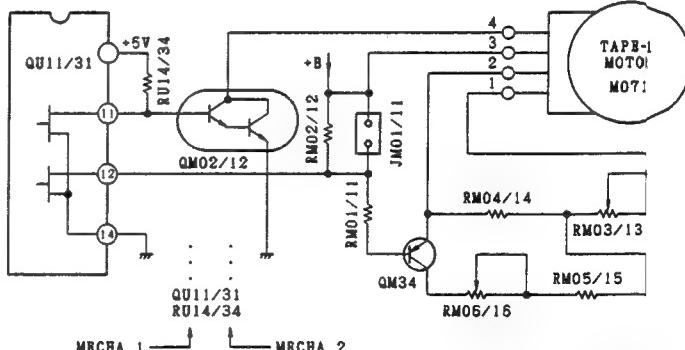


Figure 10

Other than the normal tape running condition, the capstan motor also rotates when the head chassis is shifted up and down. Therefore, when a malfunction occurs in the capstan motor drive circuit, the head chassis cannot be moved.

#### High-Speed Mode:

To rotate the capstan motor in high speed mode, set QM34 to OFF. By short-circuiting JM01/11, the capstan motor is changed to the high-speed mode during Play. When performing speed adjustment, first adjust in the high speed mode, then perform normal speed adjustment.

### 5.3 Solenoid Drive Circuit

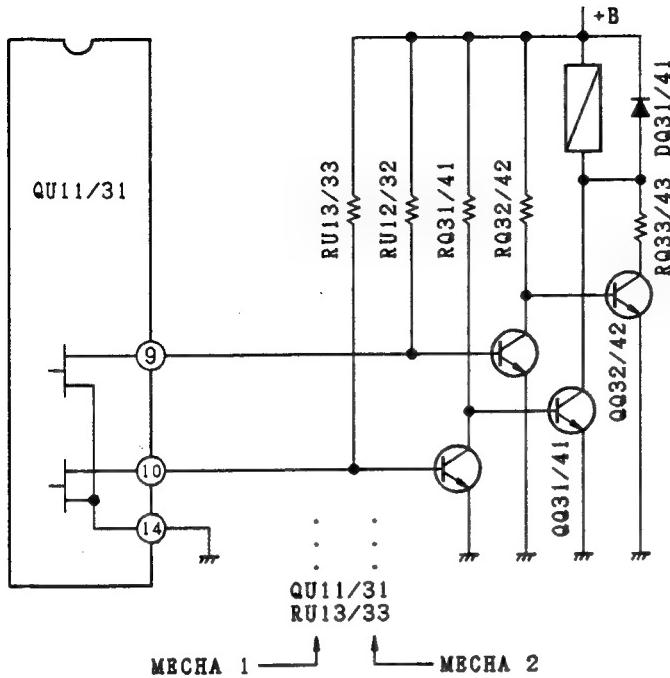


Figure 11

To shift the head chassis up/down, solenoids are energized for a fixed time so that the cam gear and the flywheel gear can engage.

Depending on the shape of the gear and its purpose, the energizing time differs.

RQ33/34 prevent heating of solenoid when it is pulled continuously such as Cue/Rev mode.

QU11/31 PIN NO.	STOP → FWD PLAY	STOP → REV PLAY	FWD/REV PLAY → STOP	CUE/REV
⑨	[Timing: 60ms]	[Timing: 320ms]	[Timing: 60ms]	—
⑩	[Timing: 60ms]	[Timing: 60ms]	[Timing: 60ms]	—

## 6. OTHER INPUTS AND OUTPUTS

### 6.1 QMS

Press the QMS button repeatedly by the number of tunes to be skipped during STOP or PLAY mode, and then press FF or REW button ( $\triangleleft/\triangleright$ ) in the direction of the desired tune to be selected to activate the tune select function. At this time, the FL counter shows the number (1 to 15) pressed.

The QMS circuit converts the playback signal through the comparator so that the microprocessor can be read. The level setting is performed by the QMS circuit, and judgement of the interval time between tunes is set internally in the microprocessor.

#### 6.1.1 Playback speed and time constant

If the FF/REW time is set to 100 sec, the FF/REW speed at the beginning of the tape is 11 times normal PLAY speed, and becomes approx. 25 times at the end of the tape. The interval between tunes is usually set to 4 seconds in PLAY speed. Therefore, the interval time between tunes in the CUE/REVIEW mode becomes 160–370 msec.

#### 6.1.2 Microprocessor setting

The mechanism microprocessor provided with this unit uses the time-read system for detecting the interval between tunes. For this, it takes 3 seconds in PLAY mode and 120 msec in CUE/REVIEW mode to read out the intervals.

#### 6.1.3 Judgement level setting

(0dB, 200nWB: The characteristic that Q01 output goes high from low according to the recording level on the tape)

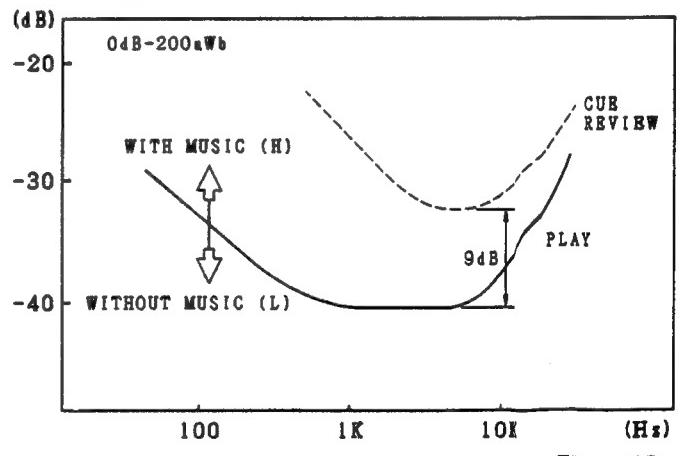


Figure 12

- a) Frequency response is changed between PLAY mode and search mode, to prevent malfunction with the music signal. In PLAY mode, QB02 is turned ON and the frequency response is widened.
- Switching between PLAY mode and search mode is performed by pin ⑤ of QU01; it goes low in PLAY mode.

### 6.2 REEL PULSE Terminal

Pin ⑦ of QU11/31 is connected to the output of the reel rotation sensor. Using this output, Auto Shut-off, Memory Rewind Stop and cueing compensation in QMS mode are performed.

The Auto Shut-off function is operated 5.2 seconds after the reel rotation output pulse is stopped.

## 7. SINGLE-CHIP 4-BIT MICROCOMPUTER FOR LM6413E (QU11/QU31) N-CHANNEL E/D MOS LSI

### • SYSTEM BLOCK DIAGRAM

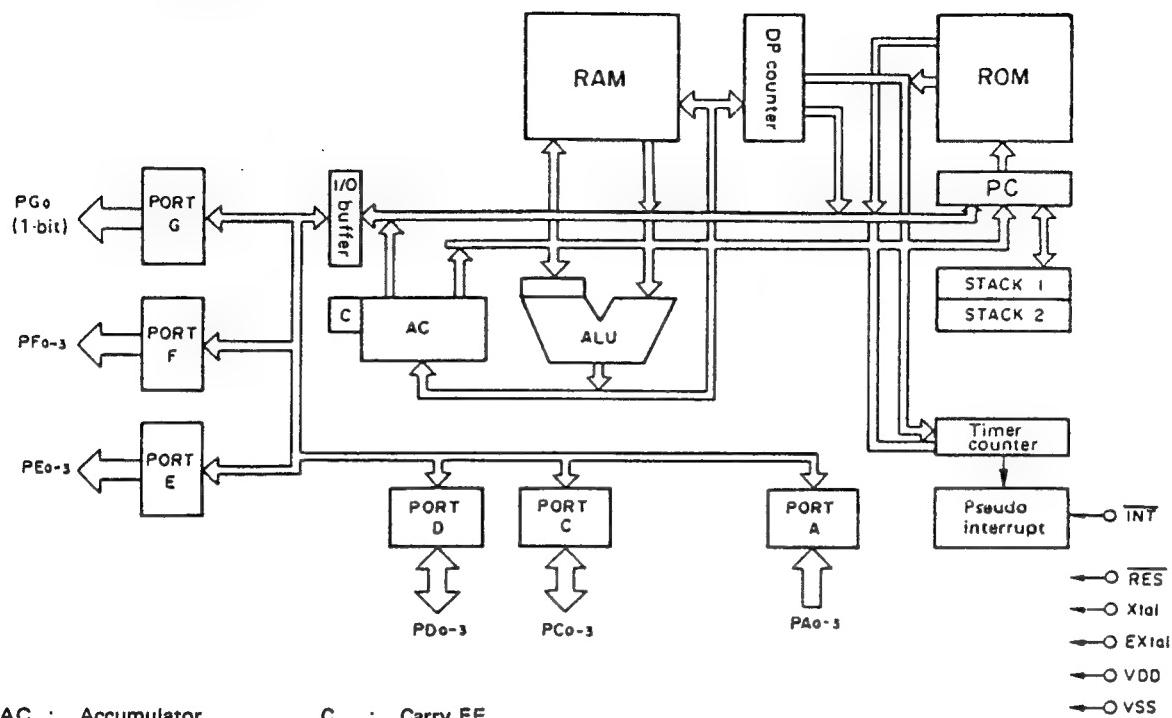
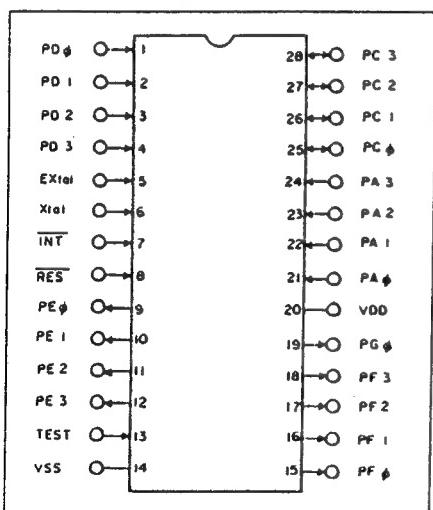


Figure 13

### • PACKAGE AND TERMINAL NAME



#### (Terminal Name)

Xtal, EXtal	Resonator for oscillator
INT	Interrupt
RES	Reset
PA0-3	I/O port A0-3
PC0-3	I/O port C0-3
PD0-3	I/O port D0-3
PE0-3	I/O port E0-3
PF0-3	I/O port F0-3
PG0	Output port G0
TEST	Test

● TERMINAL FUNCTION (LM6413E QU11/QU31)

Terminal Name	I/O	Function
<u>INT</u>	Input	Pseudo interrupt request input terminal.
<u>RES</u>	Input	Reset input terminal.
<u>PA<sub>3-0</sub></u>	Input	Input ports A <sub>3</sub> to A <sub>0</sub> . In input mode, 4-bit input and bit test are allowed.
<u>PC<sub>3-0</sub></u>	I/O	I/O ports C <sub>3</sub> to C <sub>0</sub> . In input mode, 4-bit input and bit test are allowed. In output mode, 4-bit output, bit set/reset and immediate data output are allowed.
<u>PD<sub>3-0</sub></u>	I/O	I/O ports D <sub>3</sub> to D <sub>0</sub> . In input mode, 4-bit input and bit test are allowed. In output mode, 4-bit output, bit set/reset and immediate data output are allowed.
<u>PE<sub>3-0</sub></u>	Output	Output ports E <sub>3</sub> to E <sub>0</sub> . 4-bit output and bit set/reset are allowed.
<u>PF<sub>3-0</sub></u>	Output	Output ports F <sub>3</sub> to F <sub>0</sub> . 4-bit output and bit set/reset are allowed.
<u>PG<sub>0</sub></u>	Output	Output port G <sub>0</sub> . In output mode, 1-bit output and bit set/reset are allowed.
X'tal	I/O	External terminal of the resonance circuit for local clock signal oscillation. A ceramic resonator and CR are connected to the space between this terminal and Ex'tal terminal.
Ex'tal	Input	Terminal operated with clock signal externally supplied. A ceramic resonator and CR are connected to the space between the X'tal and this terminals when using the local clock signal oscillator.
V <sub>DD</sub>	Input	Power terminal, usually connected to +5V.
V <sub>SS</sub>		Connected to 0V of power supply.
TEST	Input	LSI test terminal, usually connected to V <sub>SS</sub> (0V).

$\mu$ PD75206CW (QU01) W-MECHA FEATURE & COUNTURE DRIVER

BLOCK DIAGRAM

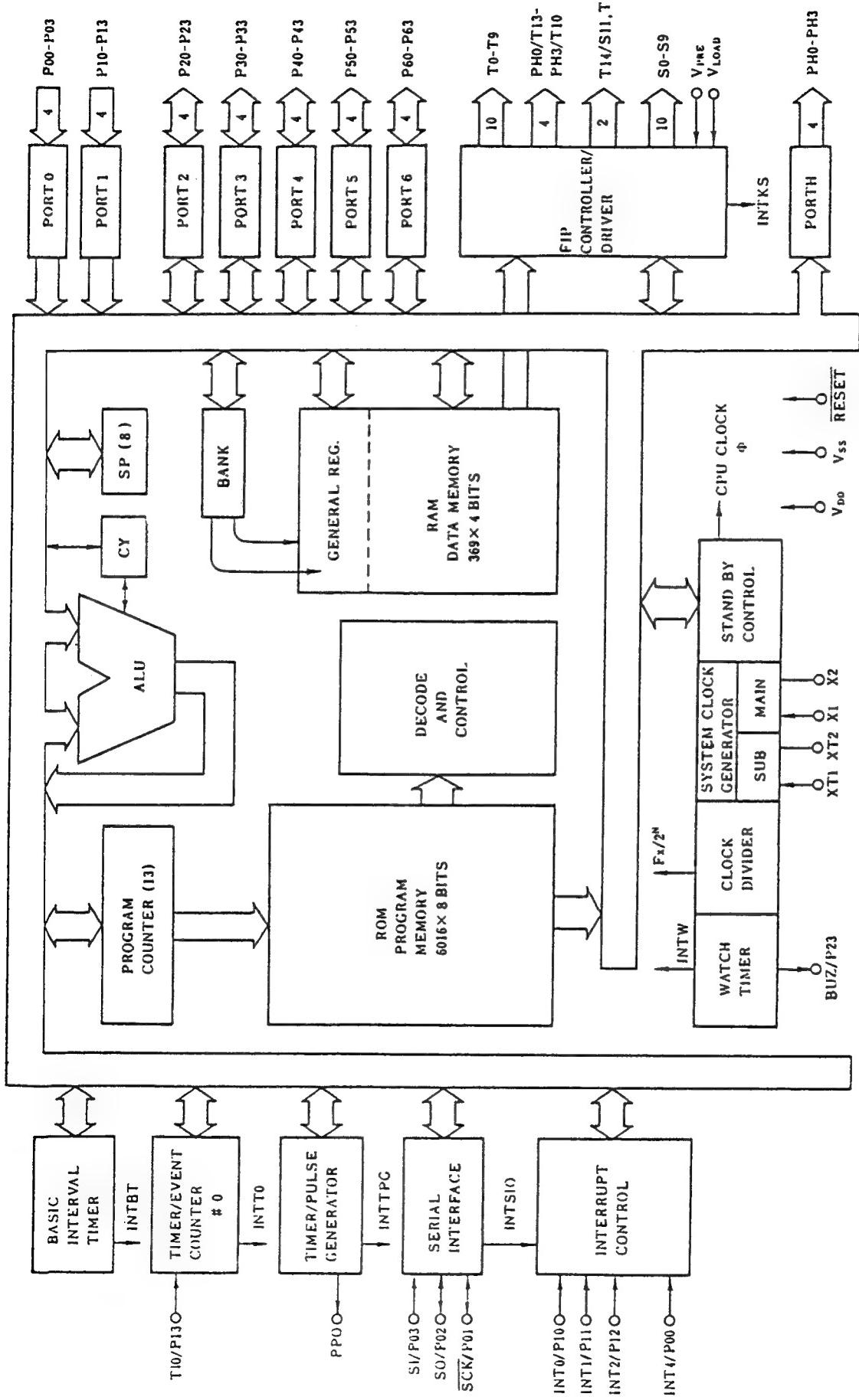
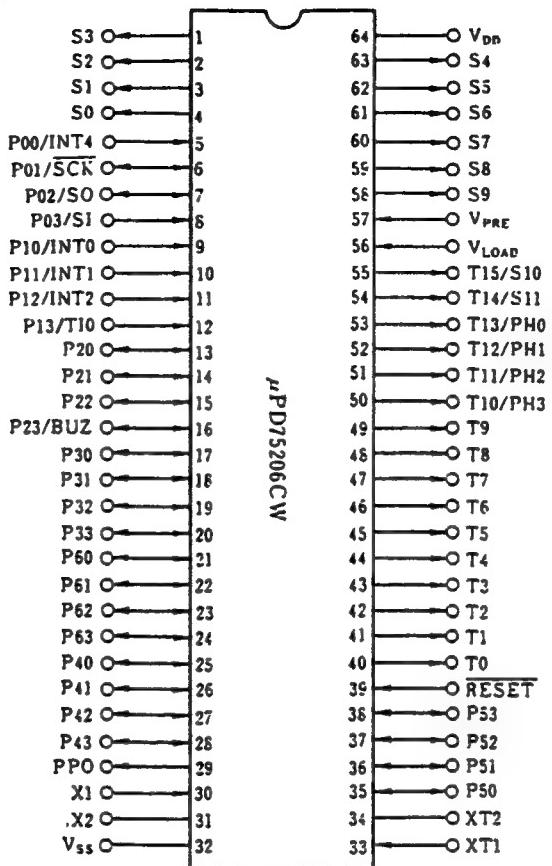


Figure 14

### Terminal Connection (Top View)



### 1. Terminal Function

#### 1.1.

Pin	Input/ Output	Combined Terminal	Function	When Reset
P00	Input	INT4	4-bit input port (PORT0)	Input
P01	Input/Output	SCK		
P02	Input/Output	SO		
P03	Input	SI		
P10	Input	INT0	With noise removal function	Input
P11		INT1		
P12		INT2		
P13		T10		
P20	Input/ Output	—	4-bit I/O port (PORT2)	Input
P21		—		
P22		—		
P23		BUZ		
P30-P33	Input/ Output	—	Programmable 4-bit I/O port (PORT3). I/O setting is possible in 1-bit units.	Input
P40-P43	Input/ Output	—	4-bit I/O port (PORT4). Permits direct LED control.	Input
P50-P53	Input/ Output	—	4-bit I/O port (PORT5). Permits direct LED control.	Input
P60-P63	Input/ Output	—	Programmable 4-bit I/O port (PORT6). I/O setting is possible in 1-bit units. Built-in pulldown resistor. Optimum for key input.	Input
PH0	Output	T11	4-bit P-ch open-drain, high voltage resistance, large current output port (PORTH). Permits direct LED control. Pulldown resistor attachable (mask option).	Low level (with pulldown resistor attached) or high impedance.
PH1		T12		
PH2		T13		
PH3		T14		

## 1.2.

Pin	Input/ Output	Combined Terminal	Function	When Reset
T0-T9	Output	—	High voltage resistance, large current digit output port.	Low level (with pulldown resistor attached) or high impedance (w/o pulldown resistor).
T10-T13		PH3-PH0	High voltage resistance, large current digit output port. Surplus pins can be used as PORTH.	
T14/S11, T15/S10		—	High voltage resistance, large current digit/segment output port. Can also be used for static output.	
S9		—	High voltage resistance segment output port. Can also be used for static output.	
S0-S8		—	High voltage resistance segment output port.	
PP0	Output	—	Timer/pulse generator pulse output port.	High impedance
T10	Input	P13	External event pulse input port for the timer/event counter.	
SCK	Input/Output	P01	Serial clock input port.	Input
SO	Input/Output	P02	Serial data output or input/output port.	Input
SI	Input	P03	Serial data input or normal input port.	Input
INT4	Input	P00	Edge detection vector insertion input port (both rising and falling edges are detected).	
INT0	Input	P10	Edge detection vector insertion input port (with noise reduction) (the detected edge can be selected).	
INT1		P11		
INT2	Input	P12	Edge detection testable input port (rising edge is detected).	
BUZ	Input/Output	P23	Fixed frequency output port (for buzzer or system clock trimming).	Input
X1, X2		—	Main system clock oscillator crystal/ceramic connection port. When using an external clock, input to X1, and its opposite phase to X2.	
XT1, XT2		—	Sub system clock oscillator crystal connection port. When using an external clock, input to XT1, and open XT2.	
RESET	Input	—	System reset input port (low level active).	
V <sub>PRE</sub>		—	FIP controller/driver output buffer power supply port.	
V <sub>LOAD</sub>		—	FIP controller/driver pulldown resistance connection port.	
V <sub>DD</sub>		—	Positive power terminal.	
V <sub>SS</sub>		—	Ground terminal.	

## 8. MECHANISM OPERATIONAL DESCRIPTION

### 8.1 STOP

The head position is always pointed in the FWD direction. (Refer to Fig. 15.)

### 8.2 FWD (FORWARD) PLAY

- When voltage is applied to the solenoid, the play arm is released by the stopper of the cam, and the cam gear is engaged with the flywheel gear and rotation starts. By the rotation of the cam gear, the head chassis is driven as shown in Fig. 18.
- When the cam of Item a operates, it is guided towards the cam section for FWD operation and locked in the condition shown in Fig. 19.

### 8.3 REVERSE PLAY

- When voltage is applied to the solenoid, it is held for a duration longer than the FWD PLAY. While the solenoid is held for a longer period, it is guided to the can slot for REVERSE operation and locked in the condition shown in Fig. 20.
- The head chassis is driven in the same way as Item. 6.2 a above.

### 8.4 FWD/REV PLAY → STOP

Voltage is applied to the solenoid to rotate the cam gear, and the mechanism returns to the condition shown in Fig. 6.

(The head position always points in the FWD direction.)

### 8.5 CUE/REVIEW (PLAY → CUE/REVIEW)

To start CUE/REVIEW (QMS) from FWD/REVERSE PLAY, voltage begins to be applied during PLAY and the condition is as shown in Fig. 17.

### 8.6 CUE/REVIEW → PLAY

When voltage is applied to the solenoid in the condition of Item 6.5, the cam is returned to STOP mode condition and STOP then PLAY is operated.

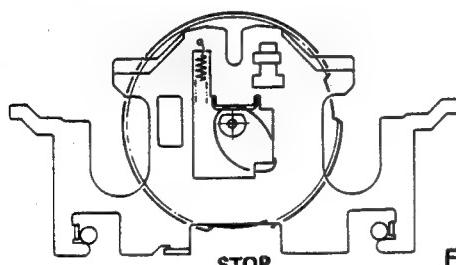


Figure 15

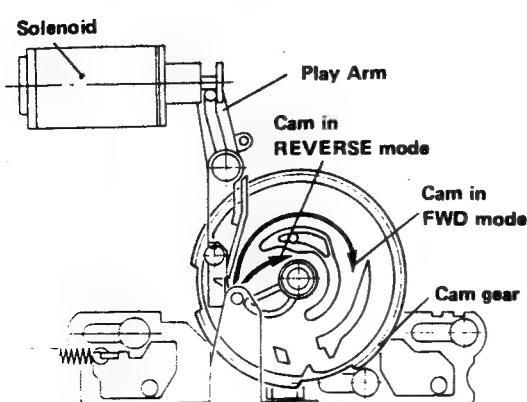


Figure 16

### Solenoid ON in CUE/REV mode

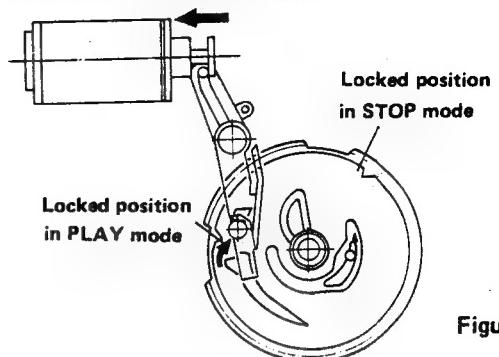


Figure 17

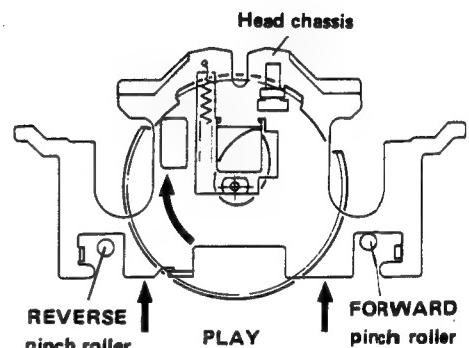


Figure 18

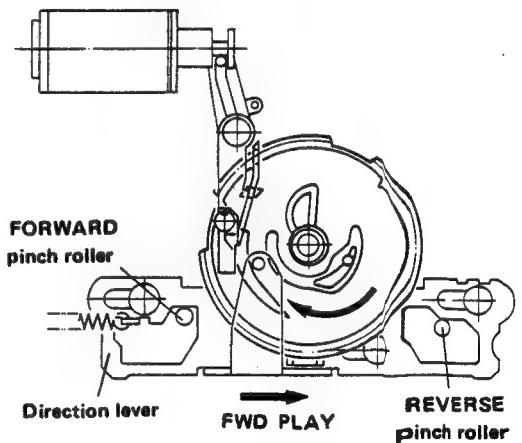


Figure 19

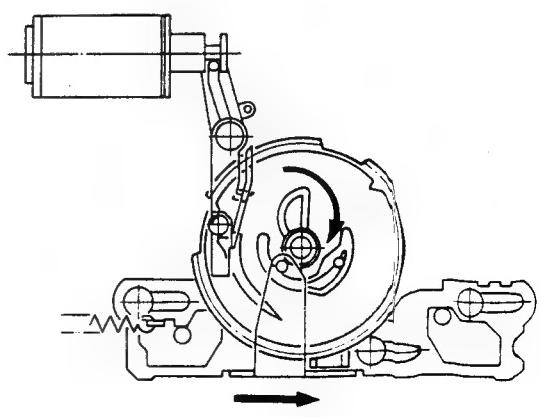
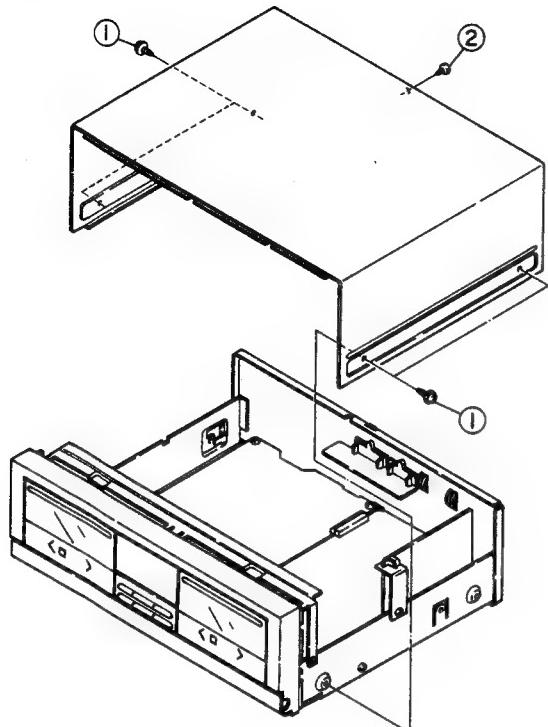


Figure 20

## 9. DISASSEMBLY

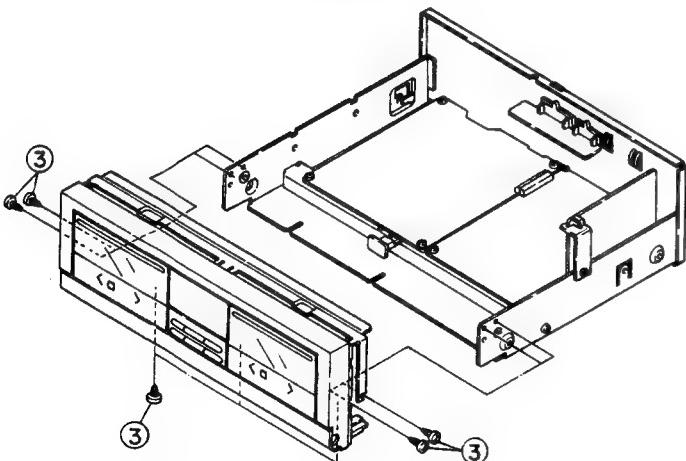
### 9.1 REMOVING THE TOP COVER

Remove the fixing screws ① 4 and ② 1 shown in the figure.



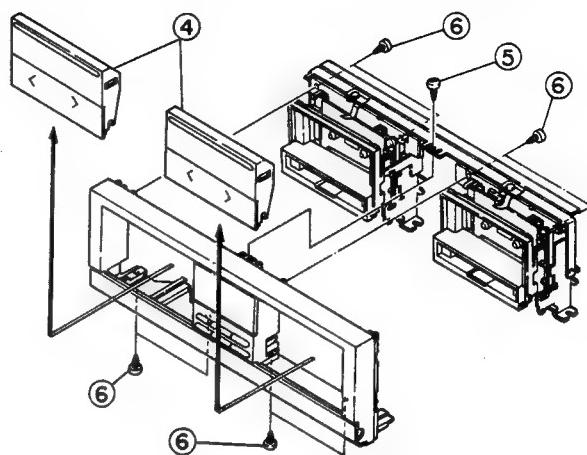
### 9.2 REMOVING THE FRONT PANEL

After removing the top cover, remove the 7 fixing screws ③ shown in the figure.



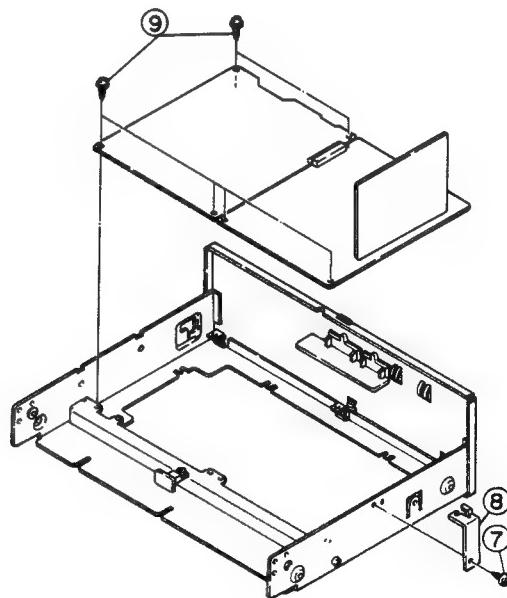
### 9.3 REMOVING THE MECHANISM

After removing the cassette covers ④ as shown in the figure, remove the ⑤ 1 and ⑥ 8 fixing screws.



### 9.4 REMOVING THE MAIN P.W. BOARD

After removing the bracket ⑧ and the fixing screw ⑦ as shown in the figure, remove the 6 board fixing screws ⑨.



## **10. ELECTRICAL ADJUSTMENTS**

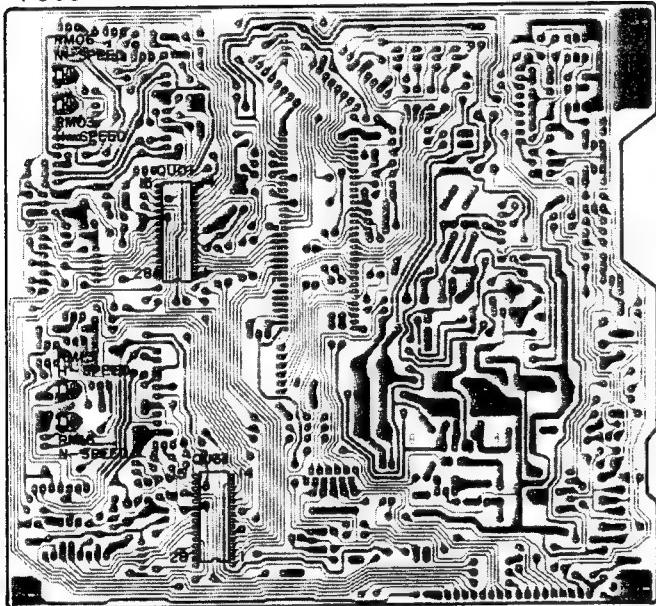
### **Precautions before Adjustment**

1. Before playing the test tape back, thoroughly demagnetize the heads, capstan and similar metal parts using an eraser as the test tape-recorded tone is easily erased.
  2. Do not place the test tape on any measuring instrument.
  3. Do not put the test tape near a place where the eraser is used.

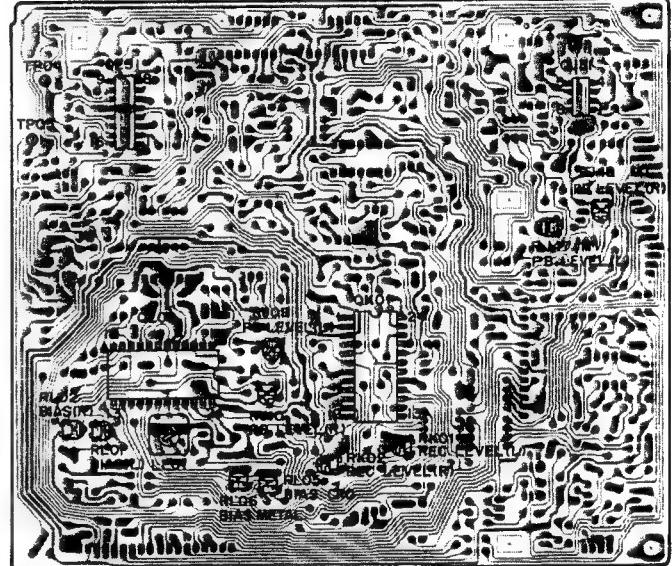
4. Method of Demagnetization: — Turn the eraser power switch on at a remote position far away from the heads. Bring the eraser close to the heads, capstan and other parts to be demagnetized, and move it up and down four or five times to demagnetize. Slowly separate the eraser far away from the parts, and turn the power switch off.
  5. Do not use any magnetize it from time to time in the course of each adjustment.
  6. Do not turn semi-fixed resistor more than needed.
  7. Do not apply locking bone excessively.

**ADJUSTMENT POINT (COMPONENT SIDE)**

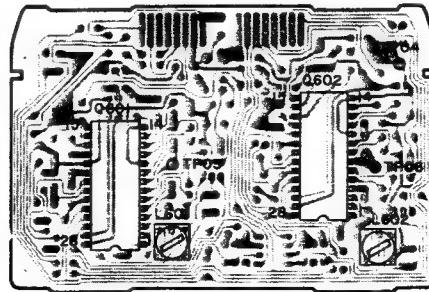
PU03



PJ03



P603



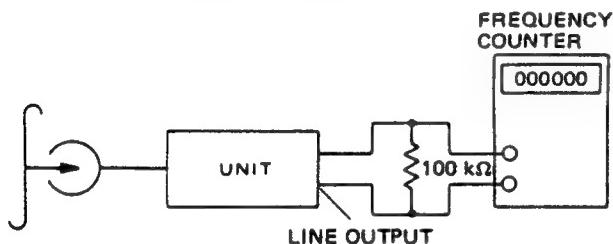
## 10.1 TAPE SPEED ADJUSTMENT

### (TAPE 1)

- Play back the middle section of the test tape TCW-211, and adjust the tape speed adjusting semi-fixed resistor (RM03) for 3000 to 3010 Hz frequency counter indication. (High speed mode: 9.5 cm/sec)  
Before above adjustment, short-circuit JM01.
- Play back the middle section of the test tape TCC-111, and adjust the tape speed adjusting semi-fixed resistor (RM06) for 2990 to 3010 Hz counter indication. (Normal speed mode: 4.8 cm/sec)
- To check that the adjustment is correctly performed, rewind the tape and play back again to confirm the counter values are within the allowable range.

### (TAPE 2)

- Play back the middle section of the test tape TCW-211, and adjust the tape speed adjusting semi-fixed resistor (RM13) for 2980 to 2990 Hz counter indication. (High speed mode: 9.5 cm/sec)  
At this time, short-circuit JM11 before adjustment.
- Play back the middle section of the test tape TCC-111, and adjust the tape speed adjusting semi-fixed resistor (RM16) for 2990 to 3010 counter indication. (Normal speed mode: 4.8 cm/sec)
- To check that the adjustment is performed correctly, rewind the test tape and play back again to confirm the counter reading value is within the allowable range.



### NOTES:

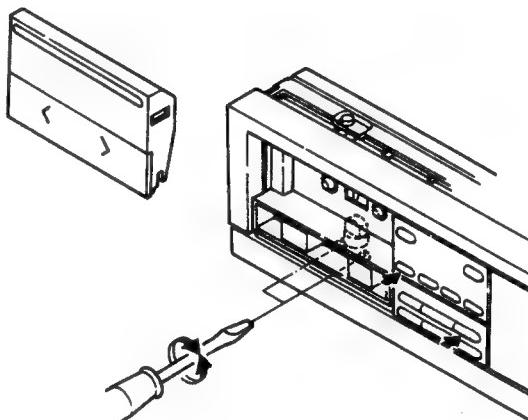
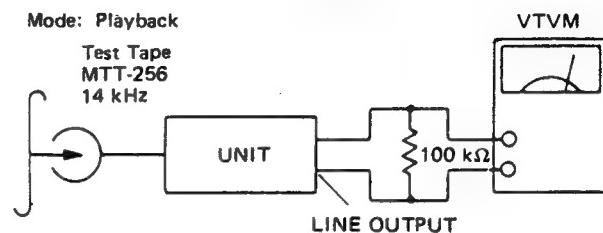
- Do not adjust after the unit is subjected to an excessive temperature change.**
- Be careful that the frequency counter may indicate an incorrect value because of too low of a counter input level.**
- Perform the above adjustments, after approx. 10 to 20 seconds.**
- When adjusting, be sure to perform the high-speed adjustment. To set the unit to high speed mode, short-circuit the pin of JY01? (JM01 for TAPE 1, JM11 for TAPE 2) from the normal playback mode.**

## 10.2 HEAD AZIMUTH ADJUSTMENT

- Play back the 14 kHz signal of the test tape MTT-256, and rotate the head azimuth adjusting screw for a maximum VTVM reading.
- If the peak level reads of the right and left channels are different, set the lower channel to maximum.
- After adjustment, be sure to lock the screws with bond.

### NOTE:

**Be sure to adjust with the same section on the same side of the tape of both TAPE 1 and TAPE 2.**



## 10.3 PLAYBACK OUTPUT LEVEL ADJUSTMENT

- Play back the test tape MTT-150, and adjust RJ47(L)/RJ48(R) for TAPE 1, RJ09(L)/RJ10(R) for TAPE 2, so that the pin voltage at the Dolby test point (TP5, 6) becomes 387.5 mV.
- Rewind the tape and play back again to confirm that both levels are the same.

## 10.4 RECORDING/PLAYBACK LEVEL ADJUSTMENT

- Load a normal tape.
- Set the ALC circuit to its maximum sensitive condition. (Short-circuit between test points TP04 and TP05 with short-circuiting pin.)
- Apply the 1 kHz, 230 mV signal to the Line Input terminal and record it. Then play it back and adjust RK01 (L) and RK02 (R) so that it becomes the same level as the monitor level. For CrO<sub>2</sub> and Metal tape, adjust following the same procedure and confirm that the level difference between the recording (input) level and the playback (monitor) level is within 1 dB.

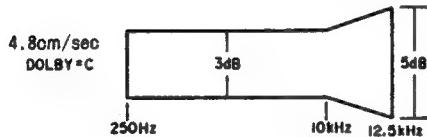
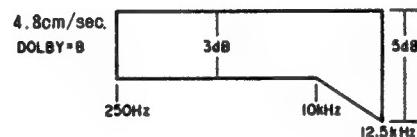
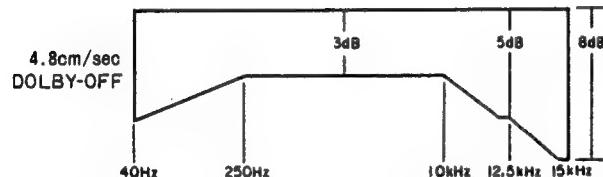
## 10.5 REC/PLAY FREQUENCY RESPONSE ADJUSTMENT AND MEASUREMENT

### (NORMAL)

1. Load the AC-212 test tape and set the deck to the recording mode (input: 230 mV). Then reduce the level by 22 dB with the attenuator and record 1 kHz and 10 kHz on the non-recorded section. (DOLBY C position)
2. Rewind the tape and play it again, and adjust RL01 (L) and RL02 (R) so that the playback level differences of 1 kHz and 10 kHz is within 0 to  $\pm 1.0$  dB.
3. After adjustment, record 1 kHz, 10 kHz and 12.5 kHz signals, and check that the playback level differences of these frequencies are as given below.
4. Set the DOLBY switch to OFF, record 1 kHz and 12.5 kHz signals, and check that the playback level differences are as given below.
5. With the DOLBY switch OFF, check that the L/R channel balance for 10 kHz is less than 3 dB.

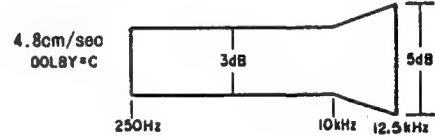
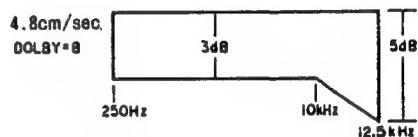
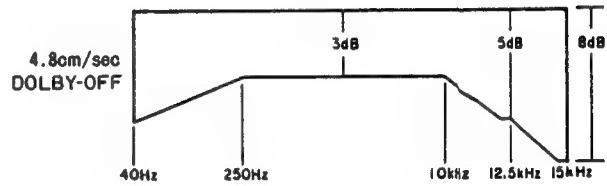
### NOTE:

When 1 kHz level difference in DOLBY C mode is 1 dB or more compared to the monitor level, adjust RK01 (L) and RK02 (R) for the recording level adjustment previously, so that the level difference is within 1 dB.



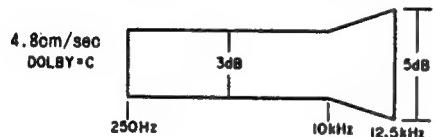
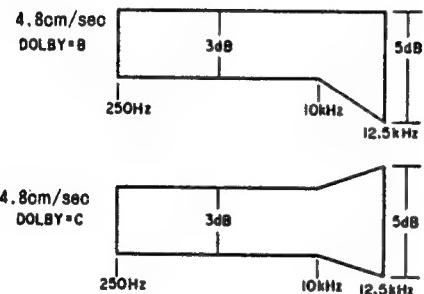
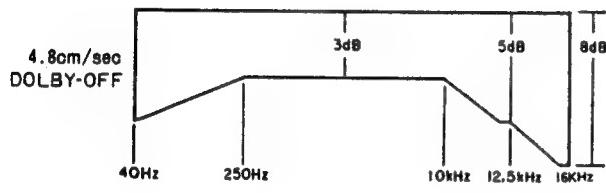
### (CrO<sub>2</sub>)

1. Load the AC-512 test tape and set the deck to the recording mode (input: 230 mV). Then reduce the level by 22 dB with the attenuator, and record 1 kHz and 10 kHz signals on the non-recorded section. (Dolby C position)
2. Rewind the tape and play it again, and adjust the Bias semi-fixed resistor RL05 so that the playback level differences of 1 kHz and 10 kHz is within 0 to  $\pm 1$  dB.
3. After adjustment, record 1 kHz, 10 kHz and 12.5 kHz signals, and check that the playback level differences are as given below.
4. Set the Dolby switch to OFF, and record 1 kHz and 12.5 kHz signals, and check that the playback level differences are as given below.
5. With the Dolby switch OFF, check that the L/R channel balance for 10 kHz is less than 3 dB.



## (METAL)

1. Load the AC-712 test tape and set the deck to the recording mode (input: 230 mV). Then reduce the level by 22 dB, and record 1 kHz and 10 kHz on the non-recorded section. (DOLBY C position)
2. Rewind the tape and play it, and adjust the BIAS semi-fixed resistor RL06 so that the 1 kHz and 10 kHz level difference is within 0 to  $\pm 1$  dB.
3. After adjustment, record 1 kHz, 10 kHz and 12.5 kHz signals, and check the playback level differences are as given below.
4. Set the Dolby switch to OFF, and record 1 kHz and 10 kHz signals, and check that the playback level differences are as given below.
5. With the Dolby switch OFF, check that the L/R channel balance for 10 kHz is less than 3 dB.

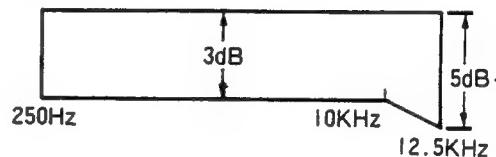


## 10.6 DUBBING REC/PLAY LEVEL MEASUREMENT

1. Load the MTT-150 test tape into TAPE 1 and AC-212 test tape into TAPE 2.
2. Set the deck to the dubbing recording mode of TAPE 1 to TAPE 2.
3. Rewind the AC-212 loaded into TAPE 2 and play back. Then measure it at DOLBY test points TP5 and TP6 to check that the playback output level becomes 387.5 mV  $\pm 1$  dB.

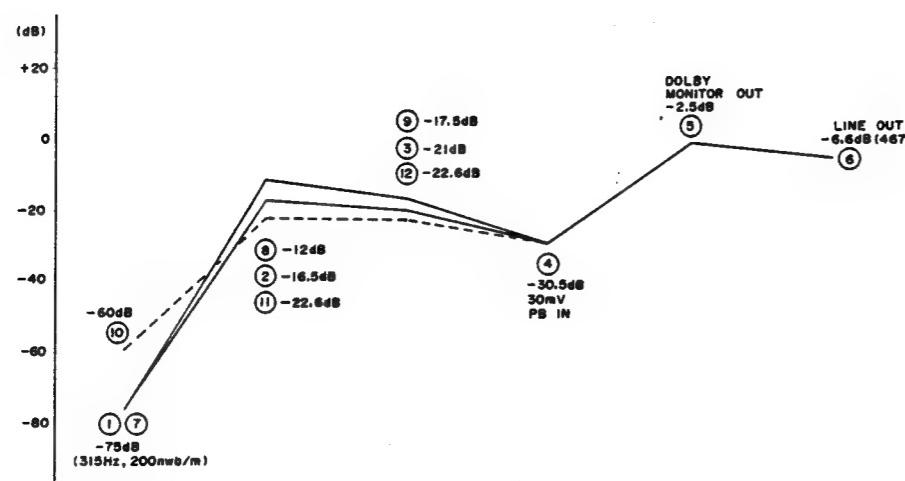
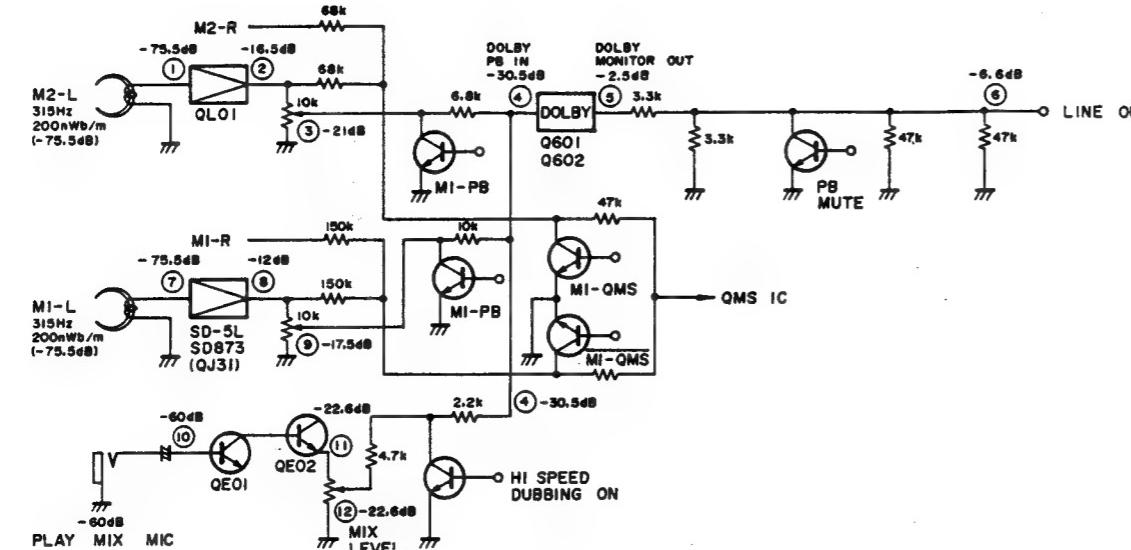
## 10.7 DUBBING REC/PLAY FREQUENCY RESPONSE MEASUREMENT

1. Load the MTT-256 test tape into TAPE 1 and AC-212 into TAPE 2.
2. Set the deck to the TAPE 1 to TAPE 2 dubbing recording mode.
3. Rewind the AC-212 loaded into TAPE 2 and play it back, and check that the level differences of 1 kHz and 12.5 kHz is as shown in the figure below.

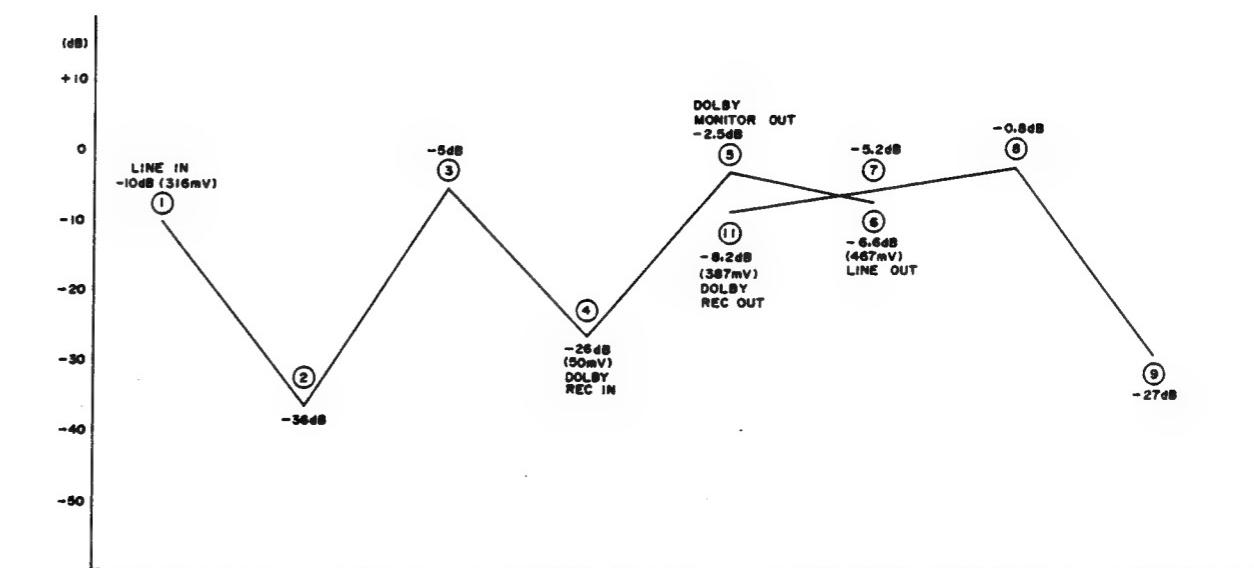
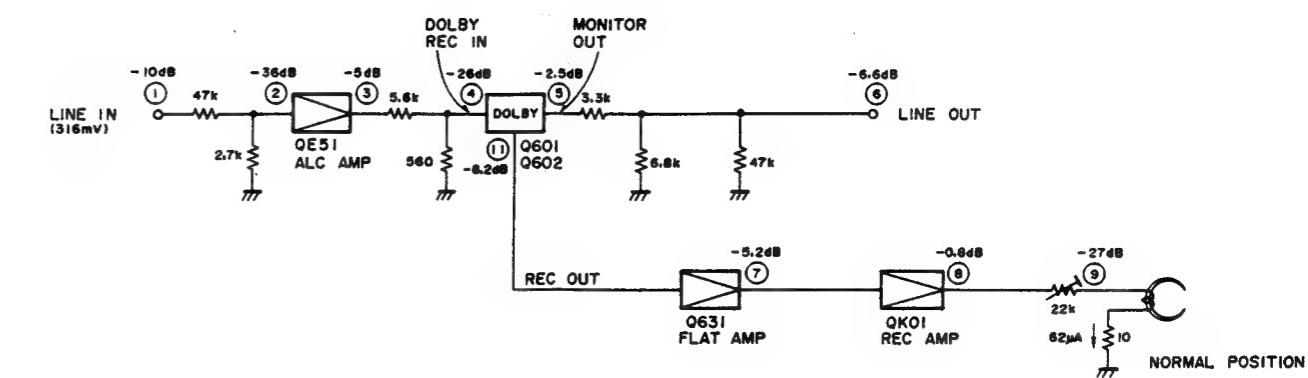


## 11. LEVEL DIAGRAMS

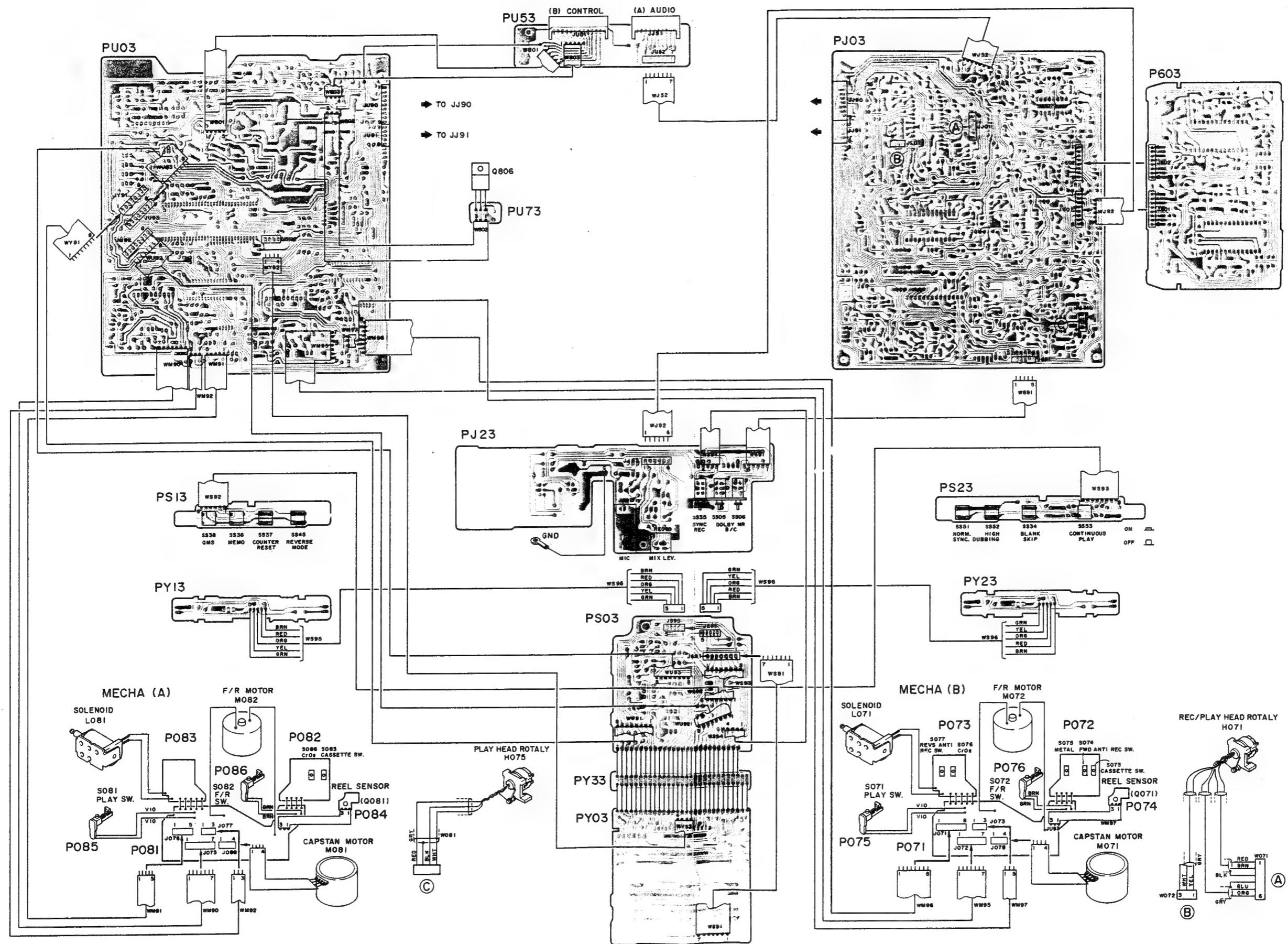
### 11.1 REC. LEVEL DIAGRAM



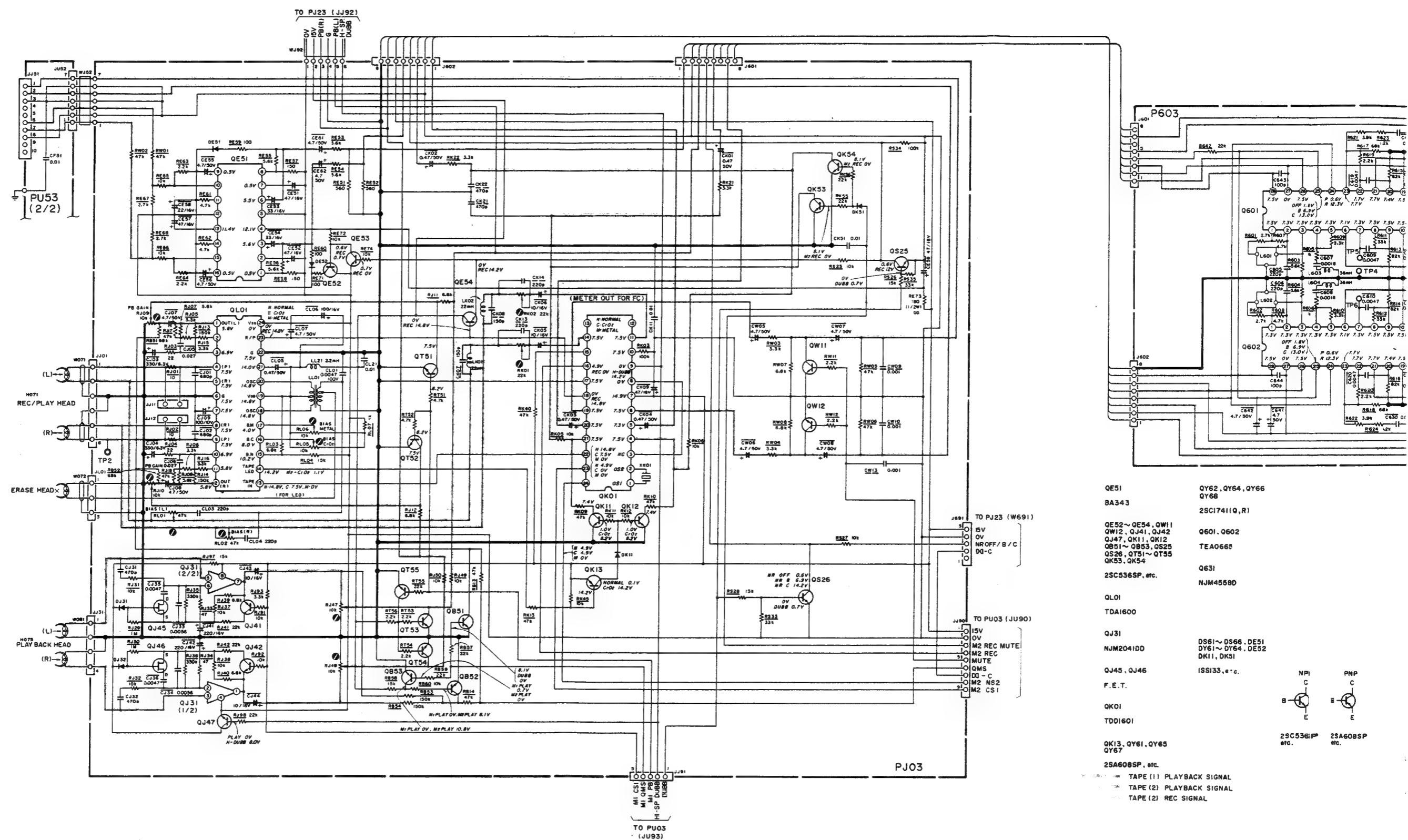
### 11.2 PLAYBACK LEVEL DIAGRAM



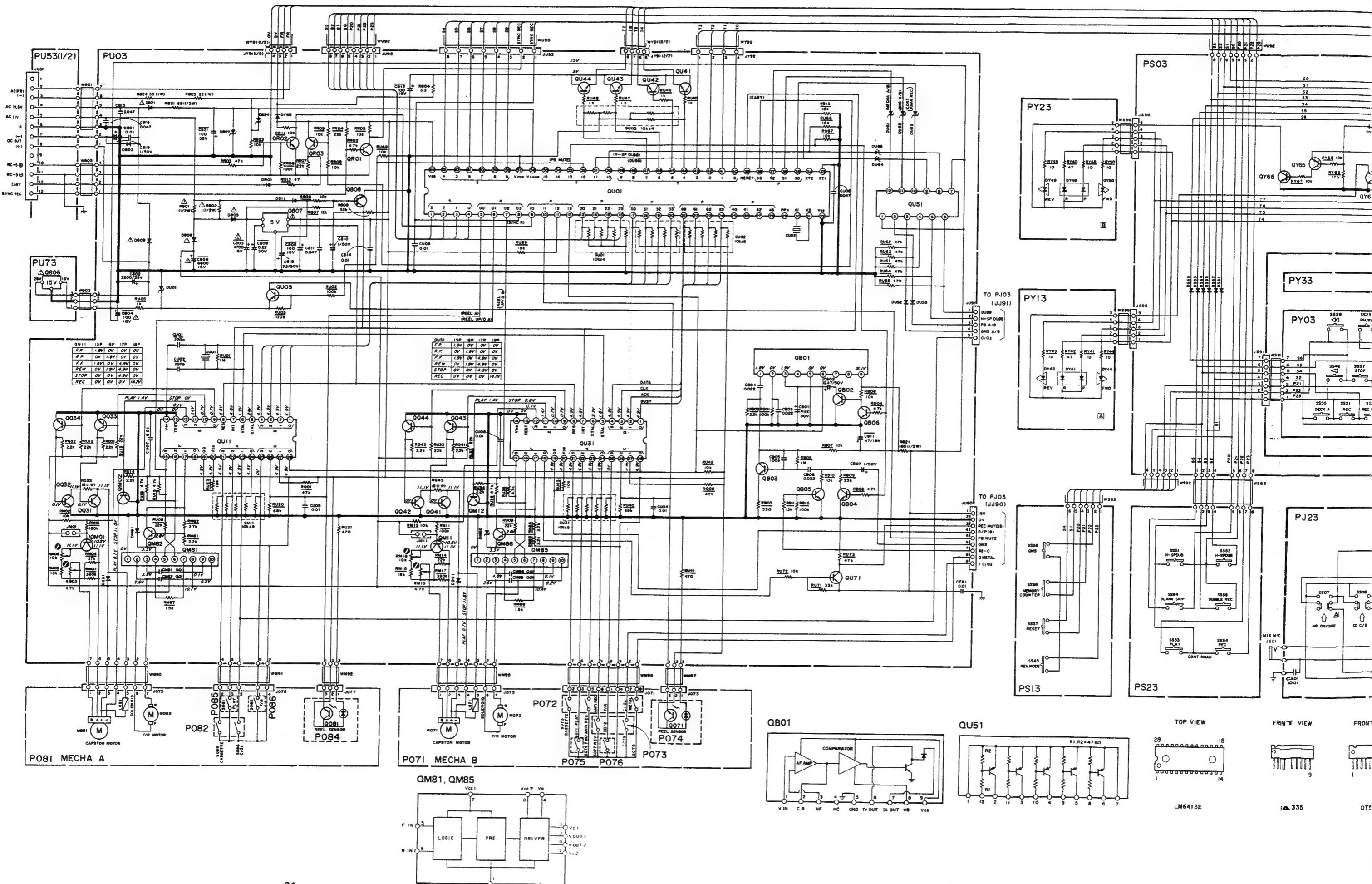
## 12. WIRING DIAGRAM

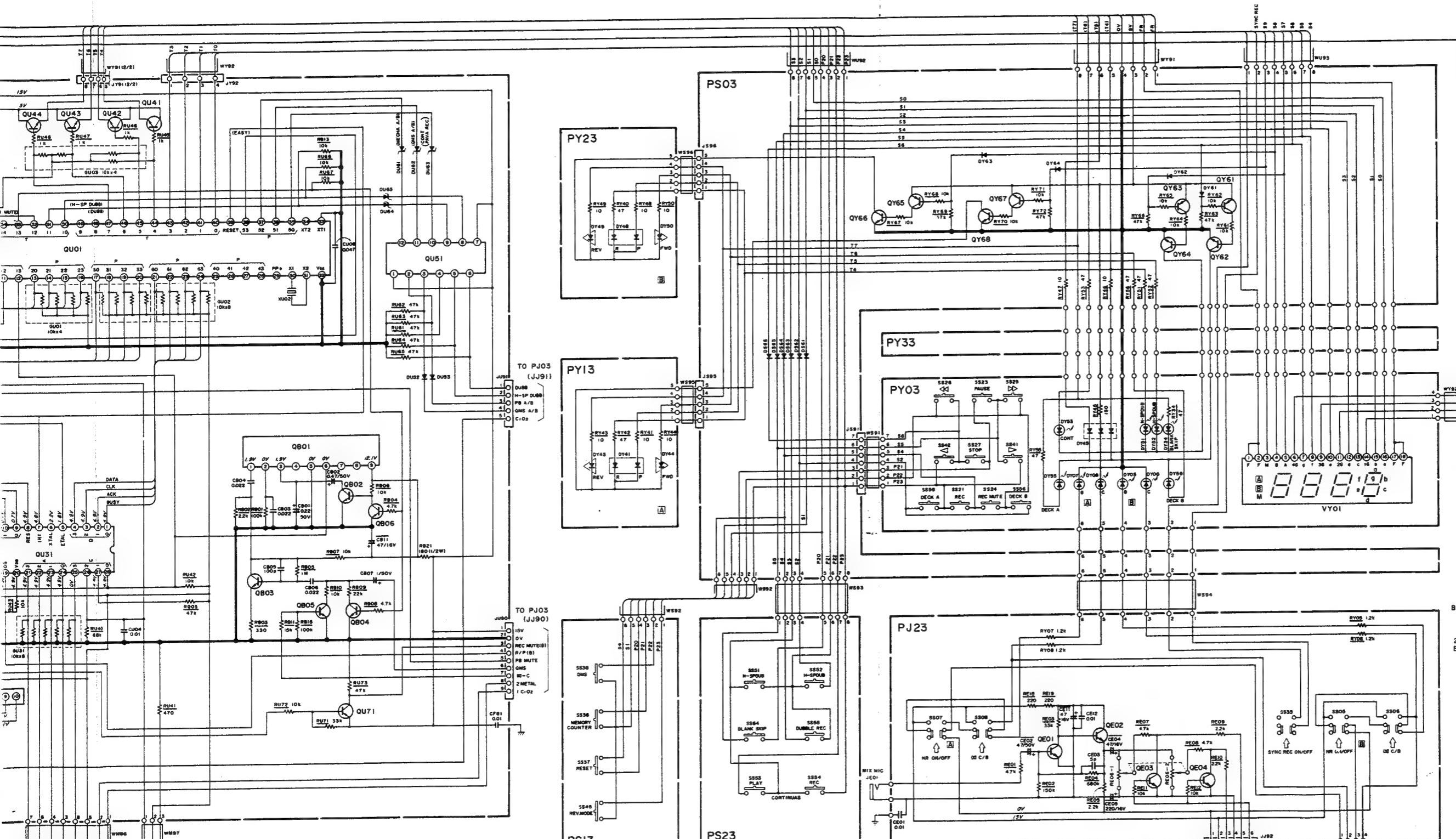


### **13. SCHEMATIC DIAGRAM**









QE01~QE04, QRO1, QRO2 DY65, DR01, DU52, DU53  
QQ33, QQ34, QQ43, QQ44 D811  
QB02~QB06, QB08 ISS135, ISS176, MA165

2SC536SP, ETC D031, D041, D0802, D0809

QY63, QRO3, QUT1, QU05 D821, D805, D806

QM62, QM66, QM01, QM11 ISR35, RL103E, DSF10C

2SA608SP, ETC D611~D615

QO31, QO41 12V ZENER

2SC2060(Q, R) DM81~DM85

QO32, QO42, QU41~QU44 4.7V ZENER

2SC1741(O, R) D822

QU51 DT5A124E

D824, DU01 24V ZENER

QU11, QU31 5.1V ZENER

LM6413E D705, D706

QU01 LT3G8B

JPD75206CW DY34, DY51~DY53, DY55

DY56 QM81, QM85

BA6109 LT3D8B

QM02, QM12 DY45

2SD1379 SLS-3103

DY41, DY48 QBO1

BA335 LN173WP68

QBO6 QY43, QY44, QY49, QY50

LD-602MR QBO7

L78MR05 TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

(PNP)

C

E

2SA608SP

ETC

μPD75206CW

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

(PNP)

C

E

2SA608SP

ETC

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

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μPD75206CW

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μPD75206CW

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2SC536SP

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TOP VIEW

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μPD75206CW

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TOP VIEW

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μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

64

32

33

μPD75206CW

(NPN)

C

E

2SC536SP

ETC

TOP VIEW

64

32

33

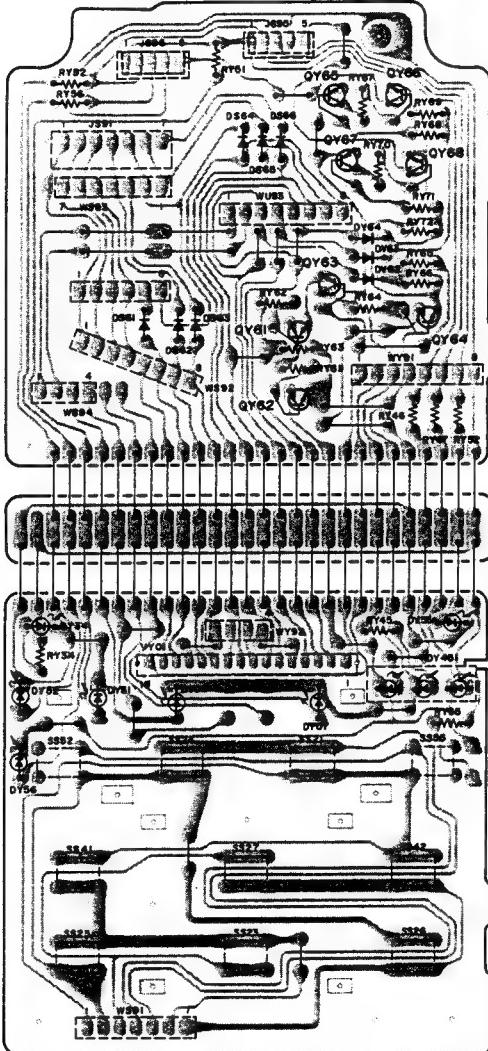
μPD75206CW

(NPN)

C

#### **14. PARTS LOCATIONS (Patern Side)**

## **PS03 - Wire Connect P.W. Board**



## **PY03 - Key Switch LED Indicator P.W. Board**

#### **PS13 - Key Switch QMS/Memory**



## PS23 - Key Switch Dubb/Continuos



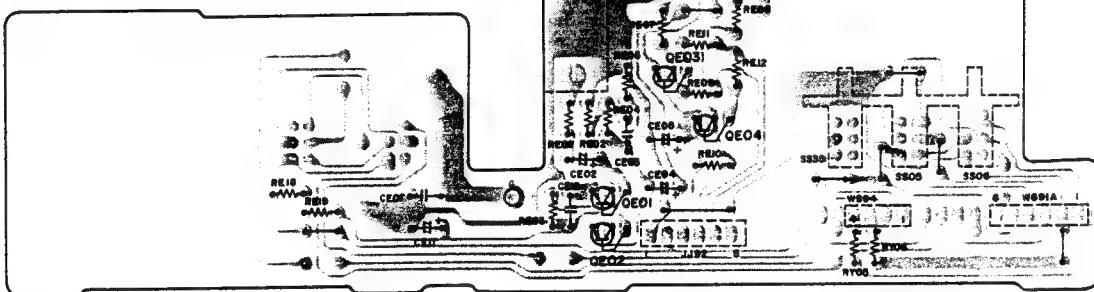
PY13 - Cassette LED M1



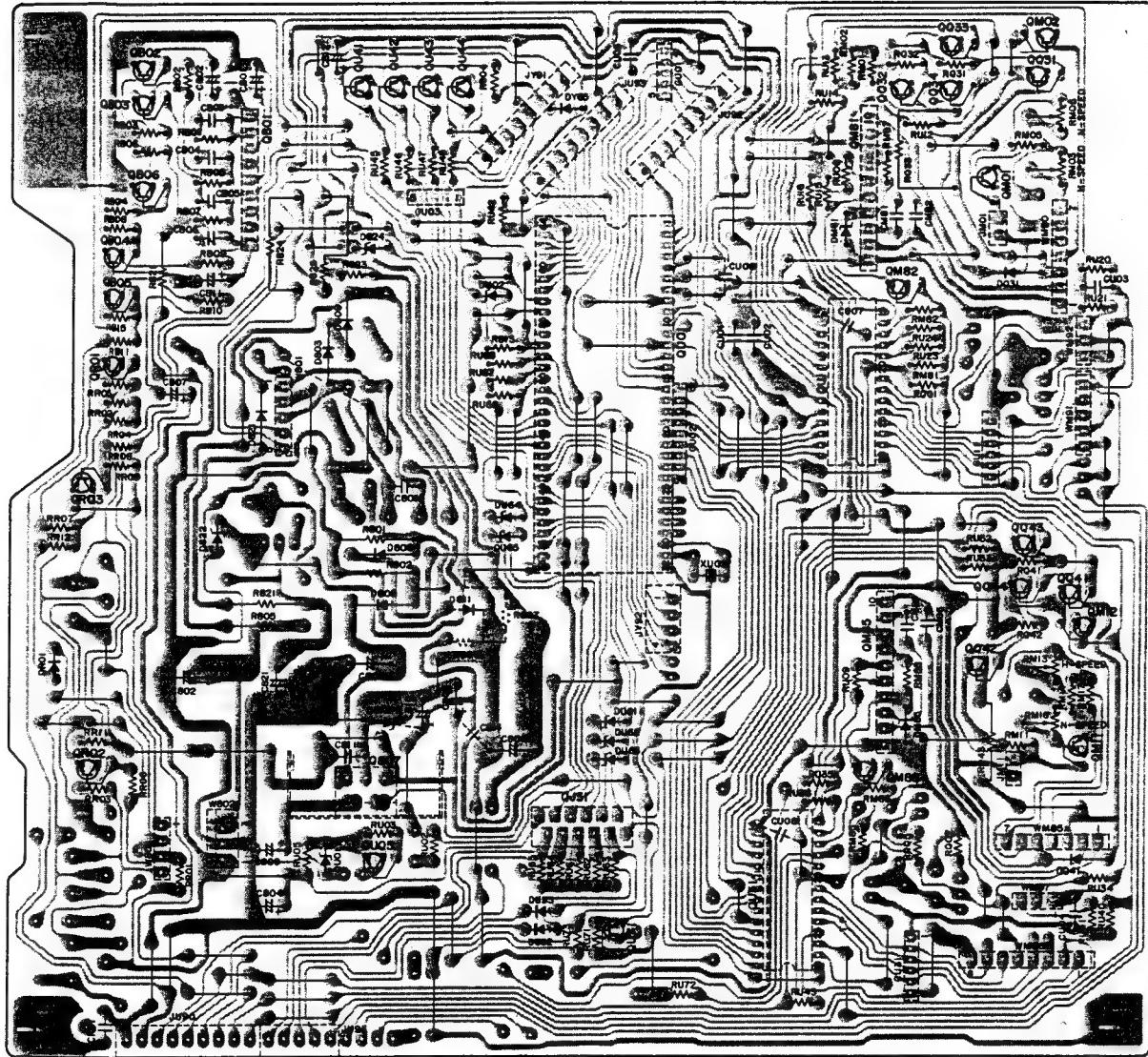
PY23 - Cassette LED M2



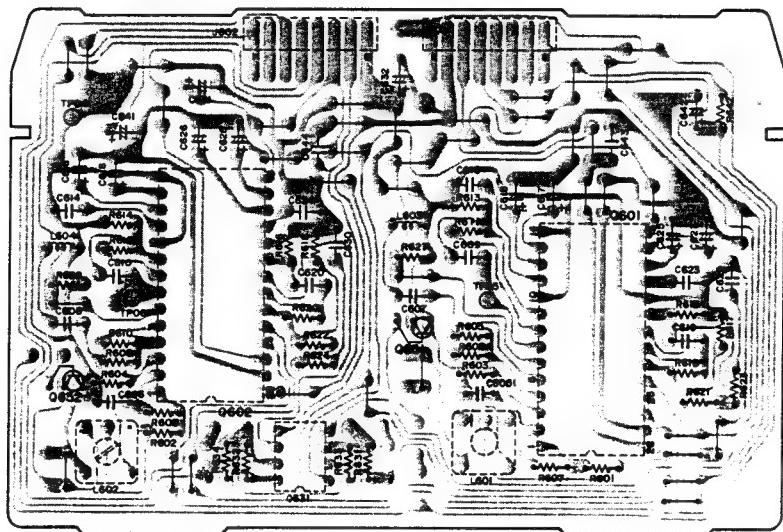
## **PJ23 - NR Switch/Mix Mic Amp P.W. Board**



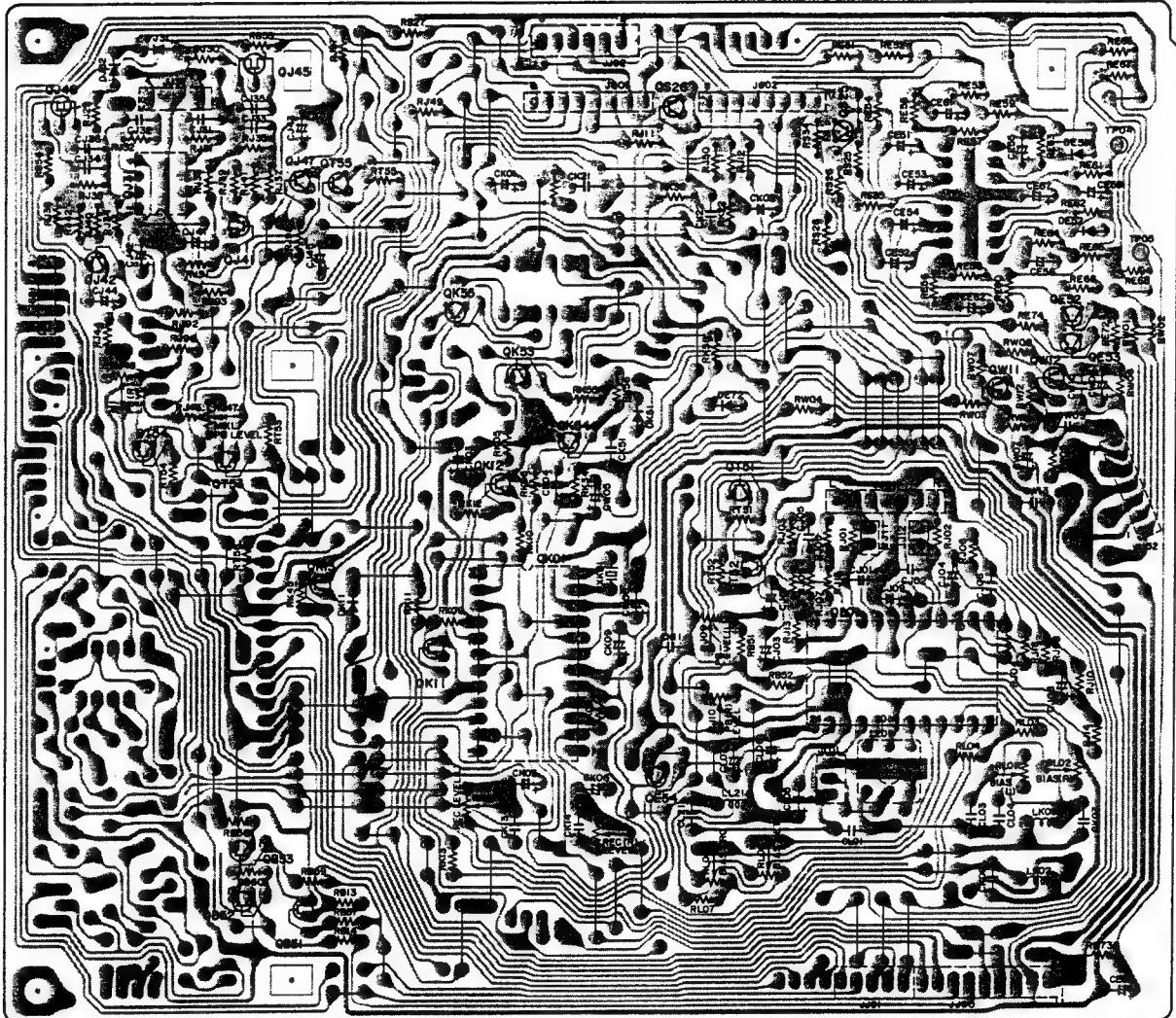
PU03 - Logic P.W. Board



**P603 - Dolby B/C P.W. Board**



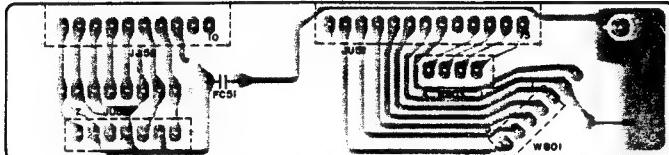
## **PJ03 - Audio Main P.W. Board**



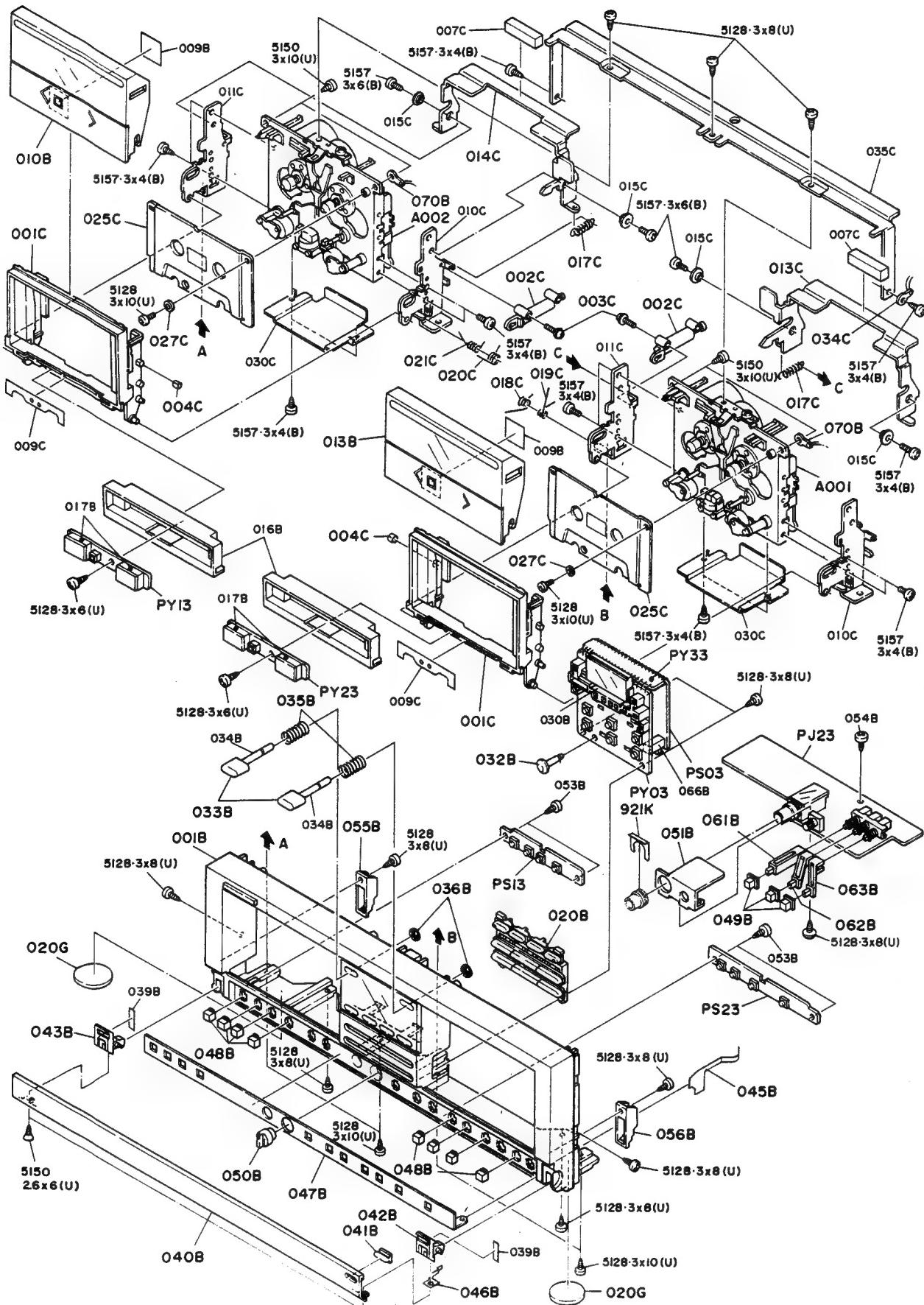
PU73 - Regulator



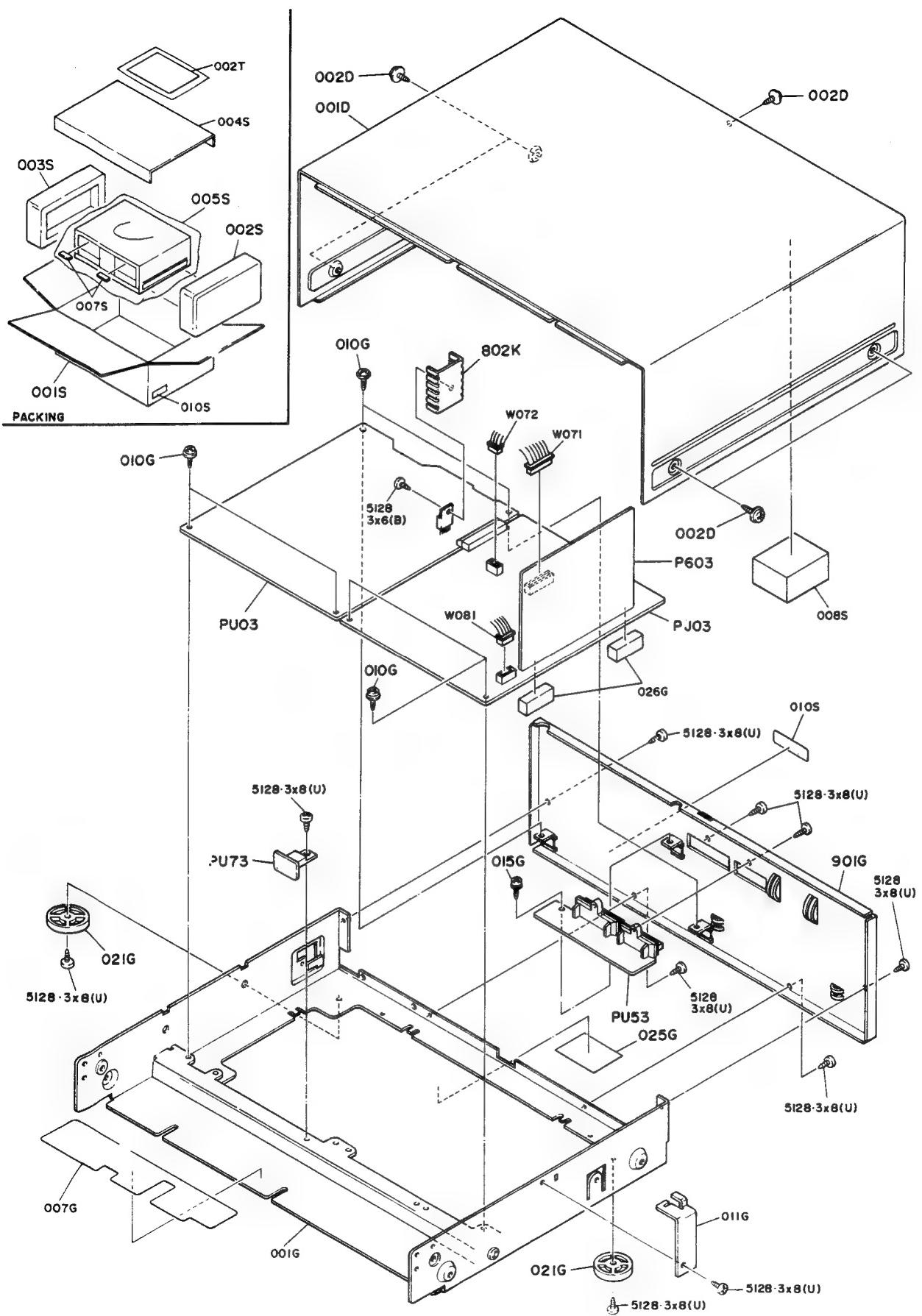
#### **PU53 - Multi Connection P.W. Board**



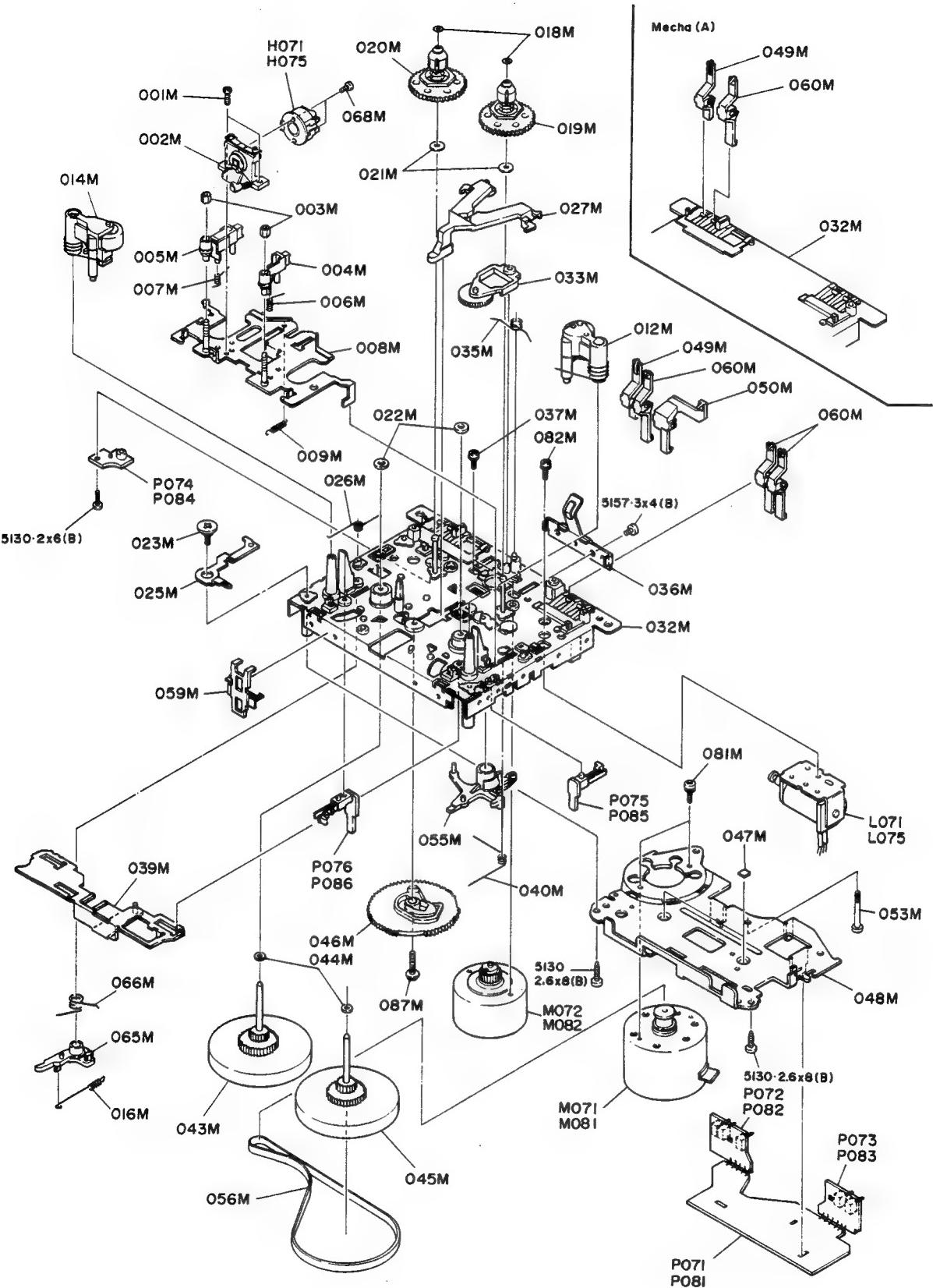
## **15. EXPLODED VIEW AND PARTS LIST**



REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 426 51184	Front Panel Assembly
010B	4822 459 20483	Cassette Window (A) Assembly
013B	4822 459 20484	Cassette Window (B) Assembly
020B	4822 410 25789	Button Assembly, Mecha
032B	4822 535 92013	Spacer
035B	4822 492 42164	Spring, Eject Button
036B	4822 532 11301	RG Ring, E Type $\phi 2.5$
040B	4822 454 20699	Escutcheon, Panel
041B	4822 412 20998	Knob, Panel
042B	4822 417 10983	Hinge (R), Panel
043B	4822 417 10984	Hinge (L), Panel
045B	4822 278 80275	Contactor, Earth
046B	4822 278 80276	Contactor, Earth
047B	4822 454 20701	Indicator, Button
048B	4822 410 25782	Button, Tact
049B	4822 410 25783	Button, Push
050B	4822 412 20997	Knob, Mix Level
051B	4822 532 21286	Retainer, Mic Jack
053B	4822 502 12115	B.T. Screw      B3 x 6
054B	4822 502 12355	B.T. Screw      B3 x 8
055B	4822 526 50096	Click (L)
056B	4822 526 50097	Click (R)
061B	4822 403 53185	Joint, Push Button
062B	4822 403 53186	Joint, Push Button
063B	4822 403 53187	Joint, Push Button
070B	4822 323 10103	Lub, Earth
001C	4822 459 20391	Door Assembly, Cassette Holder
002C	4822 464 50528	Dumper
003C	4822 502 12557	Screw, Dumper
004C	4822 492 63414	Leaf Spring, Holder Lock
013C	4822 403 53188	Hook (R), Eject
014C	4822 403 53189	Hook (L), Eject
017C	4822 492 32672	Spring, Eject Hook
018C	4822 492 41643	Spring, Door Open
019C	4822 492 41644	Spring, Cassette Open
020C	4822 492 42165	Spring, Door Open
021C	4822 492 42166	Spring, Cassette Open
025C	4822 454 11477	Escutcheon, Mecha Cover
027C	4822 532 11388	T.L. Washer, OR
034C	4822 290 30276	Lug, Earth
020G	4822 462 41142	Leg, Front
921K	4822 462 41037	Stopper, Headphone Jack
A001	4822 464 50666	Mechanism Assembly, Rec/Play
A002	4822 464 50667	Mechanism Assembly, Play



<b>REF. DESIG.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>	
001D	4822 426 40367	Lid, Top Cover	
002D	4822 502 12355	B.T. Screw	B3 x 8
010G	4822 502 12355	B.T. Screw	B3 x 8
015G	4822 502 12355	B.T. Screw	B3 x 8
021G	4822 462 41143	Leg, Rear	
025G	4822 600 70229	Label, Caution	
901G	4822 426 20111	Rear Panel Assembly [N]	
	4822 426 20112	Rear Panel Assembly [E]	
802K	4822 255 40532	Heatsink (Q807)	
001S	4822 600 70466	<b>PACKING</b> Packing Case [N]	
002S	4822 600 70473	Cushion (R)	
005S	4822 600 70347	Polyethylene Sheet	



REF. DESIG.	PART NO.	DESCRIPTION
001M	4822 502 12149	L. Washer Screw L2 x 5
002M	4822 464 50575	Bracket, Head (Mecha B)
	4822 403 53191	Bracket, Head (Mecha A)
003M	4822 505 10805	Nut, Tape Guide
004M	4822 403 30525	Guide (R), Tape
005M	4822 403 30526	Guide (L), Tape
006M	4822 492 41675	Spring (R), Tape Guide
007M	4822 492 41676	Spring (L), Tape Guide
008M	4822 464 50592	Chassis S, Head
009M	4822 492 41677	Spring, Head Chassis
012M	4822 403 40483	Pinch Roller S (R)
014M	4822 403 53225	Pinch Roller S (L)
016M	4822 492 41681	Spring, Turn Gear
018M	4822 535 71232	Spacer, Reel
019M	4822 528 10588	Table S, Supply
020M	4822 528 10589	Table S, Take-up
021M	4822 502 12167	Washer, Reel
022M	4822 535 71101	Spacer, Oil Fence
023M	4822 502 12922	Screw, Eject Lock Arm
025M	4822 403 40307	Arm, Eject Lock
026M	4822 492 41683	Spring, Eject Lock
027M	4822 403 52695	Lever, Hold
032M	4822 464 50683	Chassis S, Main
033M	4822 403 40306	Idler S
035M	4822 492 41684	Spring, Hold Lever
036M	4822 492 41689	Leaf Spring, Cassette Hold
037M	4822 502 12427	L. Washer Screw L2.6 x 6
039M	4822 404 20944	Lever S, Slide Board
040M	4822 492 32758	Spring, Slide Board
043M	4822 528 60308	Flywheel, REVS
044M	4822 532 11398	Washer
045M	4822 528 60323	Flywheel, FWD
046M	4822 522 32357	Gear, Cam
047M	4822 535 71233	Spacer, Flywheel
048M	4822 403 53224	Bracket, Flywheel
049M	4822 403 52696	Lever, Pack
050M	4822 403 52697	Lever, Metal (Mecha B)
053M	4822 502 12923	Screw, Earth
055M	4822 403 53223	Arm S, Play
056M	4822 358 30794	Belt, Main
059M	4822 256 90897	Holder, Read
060M	4822 403 52698	Lever, Anti Rec
065M	4822 403 40482	Arm, Direction
066M	4822 492 32759	Spring
068M	4822 502 12467	P.H.M. Screw P1.4 x 5
081M	4822 532 11594	L. Washer Screw L2.6 x 3
082M	4822 532 11594	L. Washer Screw L2.6 x 3
087M	4822 502 12892	Screw, Cam Gear

REF. DESIG.	PART NO.	DESCRIPTION
H071	4822 249 10328	Head, Rotary; R-P/Erase (Mecha B)
H075	4822 249 30107	Head, Rotary; Play (Mecha A)
L071	4822 157 53126	Solenoid Coil (Mecha B)
L081	4822 157 53126	Solenoid Coil (Mecha A)
M071	4822 361 60458	D.C. Motor, Main (Mecha B)
M072	4822 361 60457	D.C. Motor, F/R (Mecha B)
M081	4822 361 60458	D.C. Motor, Main (Mecha A)
M082	4822 361 60436	D.C. Motor, F/R (Mecha A)
(MECHA-B)		
J071	4822 265 10059	Jack, 8P
J072	4822 265 10064	Jack, 7P
J073	4822 265 10062	Jack, 3P
J078	4822 265 10214	Jack, 4P
J079	4822 265 10216	Jack, 4P
Q071	4822 130 10023	Photo Unit
S071	4822 277 21151	Mini Switch, Play
S072	4822 277 21151	Mini Switch, Direction
S073	4822 276 12258	Push Switch, Cassette
S074	4822 276 12258	Push Switch, Anti Rec
S075	4822 276 12258	Push Switch, Metal
S076	4822 276 12258	Push Switch, CrO <sub>2</sub>
S077	4822 276 12258	Push Switch, REV Anti Rec
(MECHA-A)		
J075	4822 265 10064	Jack, 7P
J076	4822 265 10061	Jack, 5P
J077	4822 265 10062	Jack, 3P
J088	4822 265 10214	Jack, 4P
J089	4822 265 10215	Jack, 4P
Q081	4822 130 10023	Photo Unit
S081	4822 277 21151	Mini Switch, Play
S082	4822 277 21151	Mini Switch, Direction
S083	4822 276 12258	Push Switch, Cassette
S086	4822 276 12258	Push Switch, CrO <sub>2</sub>

## 16. ELECTRICAL PARTS LIST

### ASSIGNMENT OF COMMON PARTS CODES.

#### RESISTOR

- R\*\*\*: (1) GD05 --- 140, Carbon film fixed resistor,  $\pm 5\%$ , 1/4W  
 R\*\*\*: (2) GD05 --- 160, Carbon film fixed resistor,  $\pm 5\%$ , 1/6W

① — Resistance value

#### Examples

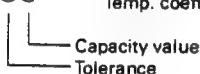
##### ① Resistance value

0.1Ω...001	10Ω...100	1kΩ...102	100kΩ...104
0.5Ω...005	18Ω...180	2.7kΩ...272	680kΩ...684
1Ω...010	100Ω...10†	10kΩ...103	1MkΩ...105
6.8Ω...068	390Ω...391	22kΩ...223	4.7MkΩ...475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

#### C\*\*\*: CERAMIC CAP.

- (1) DD1 --- 370, Ceramic condenser  
 Disc type  
 ① ② Temp. coeff. P350 ~ N1000, 50V



#### Examples

##### ① Tolerance (Capacity deviation)

$\pm 0.25\text{pF}...0$   
 $\pm 0.5\text{pF}...1$   
 $\pm 5\%...5$

\* Tolerance of COMMON PARTS handled here are as follows:

0.5pF ~	5pF ... ±0.25pF
6pF ~	10pF ... ±0.5pF
12pF ~	560pF ... ±5%
② Capacity value	
0.5pF...005	3pF...030
1pF...010	10pF...100
1.5pF...015	47pF...470
	560pF...561

#### C\*\*\*: CERAMIC CAP.

- (1) DK16 --- 300, High dielectric constant ceramic condenser  
 Disc type  
 ① Temp. chara. 284, 50V



#### Example

##### ② Capacity value

100pF...101	1000pF...102	10000pF...103
470pF...471	2200pF...222	

#### C\*\*\*: ELECTROLY CAP. ( $\parallel$ ), FILM CAP. ( $\frac{1}{2}$ )

- (1) EA --- 10, Electrolytic condenser  
 One-way lead type. Tolerance  $\pm 20\%$



#### Examples

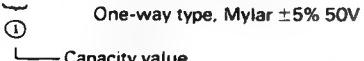
##### ① Capacity value

0.1μF...104	4.7μF...475	100μF...107
0.33μF...334	10μF...106	330μF...337
1μF...105	22μF...226	1100μF...108
		2200μF...228

##### ② Working voltage

6.3V...006	25V...025
10V...010	35V...035
16V...016	50V...050

- (2) DF15 --- 350, Plastic film condenser



#### Examples

##### ① Capacity value

0.001μF (1000pF)...102	0.1μF...104
0.018μF.....182	0.56μF...564
0.01μF.....103	1μF...105
0.015μF.....153	

REF. DESIG.	PART NO.	DESCRIPTION		
<b>PJ03-AUDIO MAIN CIRCUIT BOARD</b>				
CF03	4822 122 32486	Ceramic	0.01μF	+80% -20%
CF06	4822 122 32486	Ceramic	0.01μF	+80% -20%
<b>PJ03-CAPACITORS</b>				
CJ01	4822 121 42713	Film	680pF	±5%
CJ02	4822 121 42713	Film	680pF	±5%
CJ31	4822 121 42327	Film	470pF	±5%
CJ32	4822 121 42327	Film	470pF	±5%
CK11	4822 122 32486	Ceramic	0.01μF	+80% -20%
CK51	4822 122 32486	Ceramic	0.01μF	+80% -20%
CL01	4822 121 42791	Film	4700pF	±5%
CL03	4822 121 42344	Film	220pF	±5%
CL04	4822 121 42344	Film	220pF	±5%
CL21	4822 122 32486	Ceramic	0.01μF	+80% -20%
CW51	4822 122 32486	Ceramic	0.01μF	+80% -20%
<b>PJ03-RESISTORS</b>				
RE73	4822 111 41137	180Ω	±5%	1/2W
RJ09	4822 100 11041	10KΩ	Trimming	
RJ10	4822 100 11041	10KΩ	Trimming	
RJ47	4822 100 11041	10KΩ	Trimming	
RJ48	4822 100 11041	10KΩ	Trimming	
RK01	4822 100 20545	22KΩ	Trimming	
RK02	4822 100 20545	22KΩ	Trimming	
RL01	4822 100 11042	47KΩ	Trimming	
RL02	4822 100 11042	47KΩ	Trimming	
RL05	4822 100 11041	10KΩ	Trimming	
RL06	4822 100 11041	10KΩ	Trimming	
<b>PJ03-SEMICONDUCTORS</b>				
DE51	4822 130 33305	Diode	1SS133, etc.	
DE52	4822 130 33305	Diode	1SS133, etc.	
DJ31	4822 130 33305	Diode	1SS133, etc.	
DJ32	4822 130 33305	Diode	1SS133, etc.	
DK11	4822 130 33305	Diode	1SS133, etc.	
DK51	4822 130 33305	Diode	1SS133, etc.	
QB51	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QB52	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QB53	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QE51	4822 209 82434	IC	BA343	
QE52	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QE53	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QE54	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QJ31	4822 209 81565	IC	NJM2041DD	
QJ41	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QJ42	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QJ45	4822 130 42836	F.E.T.		
QJ46	4822 130 42836	F.E.T.		
QJ47	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QK01	4822 209 70379	IC	TDD1601	
QK11	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QK12	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QK13	4822 130 42715	Transistor	2SA608SP(F, G), etc.	
QK53	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QK54	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QL01	4822 209 70378	IC	TDA1600	

REF. DESIG.	PART NO.	DESCRIPTION		
QS25	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QS26	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QT51	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QT55				
QW11	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QW12	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
<b>PJ03-MISCELLANEOUS</b>				
JJ01	4822 265 30473	Plug, 6P		
JJ11	4822 265 20311	Plug, 2P		
JJ12	4822 265 20311	Plug, 2P		
JJ31	4822 265 30482	Plug, 4P		
JL01	4822 265 10078	Plug, 3P		
JJ90	4822 267 50681	Jack, 9P		
JJ91	4822 267 40727	Jack, 5P		
J691	4822 265 10061	Jack, 5P		
LK01	4822 152 20564	Choke Coil, 22mH		
LK02	4822 152 20564	Choke Coil, 22mH		
LL01	4822 146 10184	OSC Transformer		
LL21	4822 152 20622	Choke Coil, 22mH		
WJ52	4822 323 10059	Jumper Lead, 7P		
WJ92	4822 323 10099	Jumper Lead, 6P		
XK01	4822 242 71533	Ceramic Vibrator, CSB500E		
<b>PJ23-NR SWITCH/MIX MIC AMP CIRCUIT BOARD</b>				
<b>PJ23-CAPACITORS</b>				
CE01	4822 122 32486	Ceramic	0.01μF +80% -20%	
CE03	4822 122 40103	Ceramic	5pF ±0.25pF	
CE12	4822 122 32486	Ceramic	0.01μF +80% -20%	
<b>PJ23-RESISTOR</b>				
RE06	4822 100 20616	10KΩ(A), Variable		
<b>PJ23-SEMICONDUCTORS</b>				
QE01	4822 130 42483	Transistor	2SC536SP(F, G), etc.	
QE04				
<b>PJ23-MISCELLANEOUS</b>				
JE01	4822 267 30756	Jack, Mix Mic		
JJ92	4822 265 10063	Jack, 6P		
SS05	4822 276 12221	Push Switch, NR ON/OFF		
SS06	4822 276 12221	Push Switch, Dolby B/C		
SS35	4822 276 12221	Push Switch, Sync Rec ON/OFF		
WS94	4822 323 10088	Jumper lead, 4P		
W691	4822 323 10094	Jumper Lead, 5P		

REF. DESIG.	PART NO.	DESCRIPTION		
		<b>PS03-WIRE CONNECT CIRCUIT BOARD</b>		
		<b>PS03-SEMICONDUCTORS</b>		
DS61	4822 130 33305	Diode	1SS133, etc.	
DS66				
DY61	4822 130 33305	Diode	1SS133, etc.	
DY64				
QY61	4822 130 42715	Transistor	2SA608SP(F, G), etc.	
QY62	4822 130 43191	Transistor	2SC1741(Q, R)	
QY64	4822 130 43191	Transistor	2SC1741(Q, R)	
QY65	4822 130 42715	Transistor	2SA608SP(F, G), etc.	
QY66	4822 130 43191	Transistor	2SC1741(Q, R)	
QY67	4822 130 42715	Transistor	2SA608SP(F, G), etc.	
QY68	4822 130 43191	Transistor	2SC1741(Q, R)	
<b>PS03-MISCELLANEOUS</b>				
JS91	4822 265 10064	Jack, 7P		
JS95	4822 265 10112	Jack, 5P		
JS96	4822 265 10112	Jack, 5P		
<b>PS13-KEY SWITCH CIRCUIT BOARD</b>				
SS36	4822 276 11559	Push Switch, Memory		
SS37	4822 276 11559	Push Switch, Counter Reset		
SS38	4822 276 11559	Push Switch, QMS		
SS45	4822 276 11559	Push Switch, Reverse Mode		
WS92	4822 323 10239	Jumper Lead, 6P		
<b>PS23-KEY SWITCH CIRCUIT BOARD</b>				
SS34	4822 276 11559	Push Switch, Blank Skip		
SS51	4822 276 11559	Push Switch, N-Speed Dubbing		
SS52	4822 276 11559	Push Switch, H-Speed Dubbing		
SS53	4822 276 11559	Push Switch, Continuous Play		
WS93	4822 323 10154	Jumper Lead 7P		
<b>PU03-LOGIC MAIN CIRCUIT BOARD</b>				
<b>PU03-CAPACITORS</b>				
CB03	4822 122 40491	Ceramic	0.022μF +80% -20%	
CB04	4822 122 40491	Ceramic	0.022μF +80% -20%	
CB05	4822 122 31626	Ceramic	100pF ±5%	
CB06	4822 122 40491	Ceramic	0.022μF +80% -20%	
CF51	4822 122 32486	Ceramic	0.01μF +80% -20%	
CF81	4822 122 32486	Ceramic	0.01μF +80% -20%	

REF. DESIG.	PART NO.	DESCRIPTION				REF. DESIG.	PART NO.	DESCRIPTION			
CM81	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QB01	4822 209 83706	IC	BA335		
CM82	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QB02	4822 130 42483	Transistor	2SC536SP(F, G), etc.		
CM85	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QM01	4822 130 42715	Transistor	2SA608SP(F, G), etc.		
CM86	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QM02	4822 130 60174	Transistor	2SD1379		
CU03	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QM11	4822 130 42715	Transistor	2SA608SP(F, G), etc.		
CU05	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QM12	4822 130 60174	Transistor	2SD1379		
CU06	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QM81	4822 209 82059	IC	BA6109		
CU07	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QM82	4822 130 42715	Transistor	2SA608SP(F, G), etc.		
CU08	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QM85	4822 209 82059	IC	BA6109		
C801	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QM86	4822 130 42715	Transistor	2SA608SP(F, G), etc.		
C811	4822 122 40306	Ceramic	0.047μF	+80%	-20%	QQ31	4822 130 60173	Transistor	2SC2060(Q, R)		
C813	4822 122 32486	Ceramic	0.01μF	+80%	-20%	QQ32	4822 130 43191	Transistor	2SC1741(Q, R)		
<b>PU03-RESISTORS</b>											
RB21	4822 111 41137	180Ω	±5%	1/2W		QQ33	4822 130 42483	Transistor	2SC536SP(F, G), etc.		
RM03	4822 100 20524	4.7KΩ	Trimming			QQ34	4822 130 42483	Transistor	2SC536SP(F, G), etc.		
RM06	4822 100 11041	10KΩ	Trimming			QQ41	4822 130 60173	Transistor	2SC2060(Q, R)		
RM13	4822 100 20524	4.7KΩ	Trimming			QQ42	4822 130 43191	Transistor	2SC1741(Q, R)		
RM16	4822 100 11041	10KΩ	Trimming			QQ43	4822 130 42483	Transistor	2SC536SP(F, G), etc.		
RQ33	4822 116 60444	180Ω	±5%	1W, Metal		QQ44	4822 130 42483	Transistor	2SC536SP(F, G), etc.		
RQ43	4822 116 60444	180Ω	±5%	1W, Metal		QR01	4822 130 42483	Transistor	2SC536SP(F, G), etc.		
△R801	4822 116 60306	10Ω	±5%	1/2W, Fusible		QR02	4822 130 42483	Transistor	2SC536SP(F, G), etc.		
△R802	4822 116 60306	10Ω	±5%	1/2W, Fusible		QR03	4822 130 42715	Transistor	2SA608SP(F, G), etc.		
R804	4822 111 91403	3.3Ω	±5%	1/6W		QU01	4822 209 71763	Microprocessor	μPD75206CW		
R805	4822 116 60306	10Ω	±5%	1/2W, Fusible		QU05	4822 130 42715	Transistor	2SA608SP(F, G), etc.		
R821	4822 111 41284	68Ω	±5%	1/2W		QU11	4822 209 70386	IC	LM6413E		
R824	4822 116 60355	33Ω	±5%	1W		QU31	4822 209 70386	IC	LM6413E		
R825	4822 111 41132	22Ω	±5%	1W		QU41	4822 130 43191	Transistor	2SC1741(Q, R)		
GU01	4822 111 91185	10KΩx4, Allay				QU42	4822 130 43191	Transistor	2SC1741(Q, R)		
GU02	4822 111 91395	10KΩx8, Allay				QU43	4822 130 43191	Transistor	2SC1741(Q, R)		
GU03	4822 111 91185	10KΩx4, Allay				QU44	4822 130 43191	Transistor	2SC1741(Q, R)		
GU11	4822 111 91186	10KΩx5, Allay				QU51	4822 209 70381	IC	DT5A124E		
GU31	4822 111 91186	10KΩx5, Allay				QU71	4822 130 42715	Transistor	2SA608SP(F, G), etc.		
<b>PU03-SEMICONDUCTORS</b>											
DM81	4822 130 33759	Zener	4.7V			QY63	4822 130 42715	Transistor	2SA608SP(F, G), etc.		
DM85	4822 130 33759	Zener	4.7V			△ Q807	4822 209 70385	IC	L78MR05		
DQ31	4822 130 32508	Diode	1SR35-200A			<b>PU03-MISCELLANEOUS</b>					
DQ41	4822 130 32508	Diode	1SR35-200A			JM01	4822 265 20311	Plug, 2P			
DR01	4822 130 33305	Diode	1SS133, etc.			JM11	4822 265 20311	Plug, 2P			
DU01	4822 130 80317	Zener	RD5.1JB2			JU90	4822 265 40602	Plug, 9P			
DU52	4822 130 33305	Diode	1SS133, etc.			JU91	4822 265 30542	Plug, 5P			
DU53	4822 130 33305	Diode	1SS133, etc.			JU92	4822 265 10059	Jack, 8P			
DU61	4822 130 80091	Zener	12V			JU93	4822 265 10059	Jack, 8P			
DU65	4822 130 80091	Zener	12V			JY91	4822 265 10059	Jack, 8P			
DY65	4822 130 33305	Diode	1SS133, etc.			JY92	4822 265 10105	Jack, 4P			
D803	4822 130 32508	Diode	1SR35-200A			W801	4822 323 10056	Jumper Lead, 7P			
△ D805	4822 130 32508	Diode	1SR35-200A			W802	4822 323 10081	Jumper Lead, 3P			
△ D806	4822 130 32508	Diode	1SR35-200A			W803	4822 323 10113	Jumper Lead, 5P			
△ D809	4822 130 32508	Diode	1SR35-200A			XU01	4822 242 71405	Ceramic Vibrator, CSB800K			
D811	4822 130 33305	Diode	1SR35-200A			XY02	4822 242 71774	Ceramic Vibrator, CST4.19MT			
D812	4822 130 33948	Diode	1SS133, etc.								
△ D821	4822 130 32508	Zener	5.6V								
D822	4822 130 80116	Diode	1SR35-200A								
D824	4822 130 80272	Zener	24V								
			5.1V								

REF. DESIG.	PART NO.	DESCRIPTION	REF. DESIG.	PART NO.	DESCRIPTION
		<b>PU53-MULTI CONNECTION CIRCUIT BOARD</b>			<b>P603-DOLBY B/C CIRCUIT BOARD</b>
JJ51 JU51 JU52	4822 266 30305 4822 266 30306 4822 265 10064	Terminal, 10P Terminal, 13P Jack, 7P	C617 C618 C627 C628	4822 124 41188 4822 124 41188 4822 124 41188 4822 124 41188	<b>P603-CAPACITORS</b> Elect 0.68μF 50V Elect 0.68μF 50V Elect 0.68μF 50V Elect 0.68μF 50V
△ Q806	4822 209 82829	<b>PU73-REGULATOR CIRCUIT BOARD</b>  IC NJM78M15A	Q601 Q602 Q631	4822 209 83614 4822 209 83614 4822 209 80401	<b>P603-SEMICONDUCTORS</b> IC TEA0665 IC TEA0665 IC 4558D
DY05 DY06 DY34 DY45 DY51 DY52 DY53 DY55 DY56	4822 130 80327 4822 130 80326 4822 130 80326 4822 130 80323 4822 130 80326 4822 130 80326 4822 130 80326 4822 130 80326 4822 130 80326	L.E.D. LT3G8B L.E.D. LT3D8B L.E.D. LT3D8B L.E.D. SLS-3103 L.E.D. LT3D8B L.E.D. LT3D8B L.E.D. LT3D8B L.E.D. LT3D8B L.E.D. LT3D8B	J601 J602	4822 265 40544 4822 265 40544	<b>P603-MISCELLANEOUS</b> Plug, 8P Plug, 8P
SS21 SS23 SS24 SS25 SS26 SS27 SS41 SS42 SS55 SS56	4822 276 11559 4822 276 11559	Push Switch, REC Push Switch, Pause Push Switch, REC Mute Push Switch, FF Push Switch, REW Push Switch, Stop Push Switch, FWD Play Push Switch, REV Play Push Switch, Deck A Push Switch, Deck B	L601 L602 L603 L604	4822 157 52461 4822 157 52461 4822 156 10842 4822 156 10842	M.P.X. Coil M.P.X. Coil Choke Coil, 36mH Choke Coil, 36mH
VY01	4822 130 90431	Display Unit			
WS91 WY92	4822 323 10135 4822 323 10186	Jumper Lead, 7P Jumper Lead, 4P			
		<b>PY03-KEY SW./LED INDICATOR CIRCUIT BOARD</b>			
DY41 DY43 DY44	4822 130 80118 4822 130 80324 4822 130 80324	L.E.D. LN173WP68 L.E.D. LD-602MR L.E.D. LD-602MR			
WS95	4822 321 21419	Connective Cord, 5P			
		<b>PY13-CASSETTE LED M1 CIRCUIT BOARD</b>			
DY48 DY49 DY50	4822 130 80118 4822 130 80324 4822 130 80324	L.E.D. LN173WP68 L.E.D. LD-602MR L.E.D. LD-602MR			
WS96	4822 321 21419	Connective Cord, 5P			
		<b>PY23-CASSETTE LED M2 CIRCUIT BOARD</b>			
			(W01-99)	Assembly and Wiring	
			(T01-99)	Adjustment	
			(X01-00)	Correction	

## TECHNICAL SPECIFICATIONS (DIN)

### MODEL PM673

#### AUDIO SECTION

##### IHF Dynamic Power

8 OHMS . . . . . 75 W

##### POWER OUTPUT PER CHANNEL

EIAJ 6 OHMS . . . . . 65 W x 3

DIN 8 OHMS . . . . . 50 W x 3

TOTAL HARMONIC DISTORTION . . . . . 0.05 %

I.M. DISTORTION . . . . . 0.05 %

DAMPING FACTOR 8 OHMS (1 kHz) . . . . . 50

#### MM CARTRIDGE INPUT

Frequency Response (IEC) . . . . . ±0.5 dB

Signal-to-Noise Ratio (IEC A weighted) . . . . . 75 dB

Input Impedance . . . . . 47 k ohms

Input Capacitance . . . . . 200 pF

Input Sensitivity . . . . . 3.0 mV

#### CD INPUT

Input Impedance . . . . . 25 k ohms

Input Sensitivity . . . . . 180 mV

Signal to Noise Ratio (IEC A weighted) . . . . . 90 dB

#### OUTPUT VOLTAGE

VCR Out [7.75 mV PHONO (MM) Input] . . . . . 500 mV

#### OUTPUT IMPEDANCE

VCR Out (Source PHONO) . . . . . 1 k ohms

#### GENERAL

Power Requirements T version . . . . . 240 V AC, 50 Hz

N version . . . . . 220/240 V AC, 50/60 Hz

E version . . . . . 110 ~ 120/220 ~ 240 V AC, 50/60 Hz

#### Dimensions

Panel Width . . . . . 360 mm

Panel Height . . . . . 120 mm

Depth . . . . . 300 mm

#### Weight

Unit Alone . . . . . 11.0 kg

## MODEL ST673/ST673L

### FM TUNER SECTION

Frequency Range .....	87.5 ~ 108 MHz
Usable Sensitivity	
Mono (S/N 26 dB, 75 ohms) .....	0.9 µV
Stereo (S/N 46 dB, 75 ohms) .....	25 µV
Alternate Channel Selectivity 98 MHz (W/N) .....	65 dB
Image Response Rejection .....	60 dB
IF Rejection .....	80 dB
Spurious Response Rejection .....	75 dB
AM Suppression .....	60 dB
Signal-to-Noise Ratio	
Unweighted Mono .....	75 dB
Stereo .....	70 dB
Weighted Mono .....	78 dB
Stereo .....	72 dB
Pilot Signal & Subcarrier Rejection	
19 kHz .....	50 dB
38 kHz .....	55 dB
Total Harmonic Distortion	
Mono (W/N) .....	0.1 %
Stereo (W/N) .....	0.2 %
Frequency Response	
30 Hz ~ 15 kHz .....	+0.5, -2.0 dB
Separation	
Stereo (W/N) .....	48 dB
Channel Balance .....	0.2 dB

### MW TUNER SECTION

Frequency Range .....	531 ~ 1602 kHz
Usable Sensitivity 20 dB S/N 30% Mod., 999 kHz .....	400 µV/m
Selectivity 999 kHz, ±9 kHz .....	35 dB
Image Rejection, 999 kHz .....	45 dB
IF Rejection, 999 kHz .....	70 dB
Signal-to-Noise Ratio, 999 kHz .....	52 dB
Total Harmonic Distortion, 999 kHz .....	0.3 %

### LW TUNER SECTION

Frequency Range .....	152 ~ 282 kHz
Usable Sensitivity 20 dB S/N 30% Mod., 209 kHz .....	800 µV
Image Rejection, 209 kHz .....	45 dB
IF Rejection, 209 kHz .....	65 dB
Signal-to-Noise Ratio, 209 kHz .....	50 dB

### GENERAL

Power Requirement	N and T versions .....	110/120/220/240 V AC, 50/60 Hz
	E version .....	220/240 V AV, 50/60 Hz

### Dimensions

Panel Width .....	360 mm
Panel Height .....	55 mm
Depth .....	300 mm

### Weight

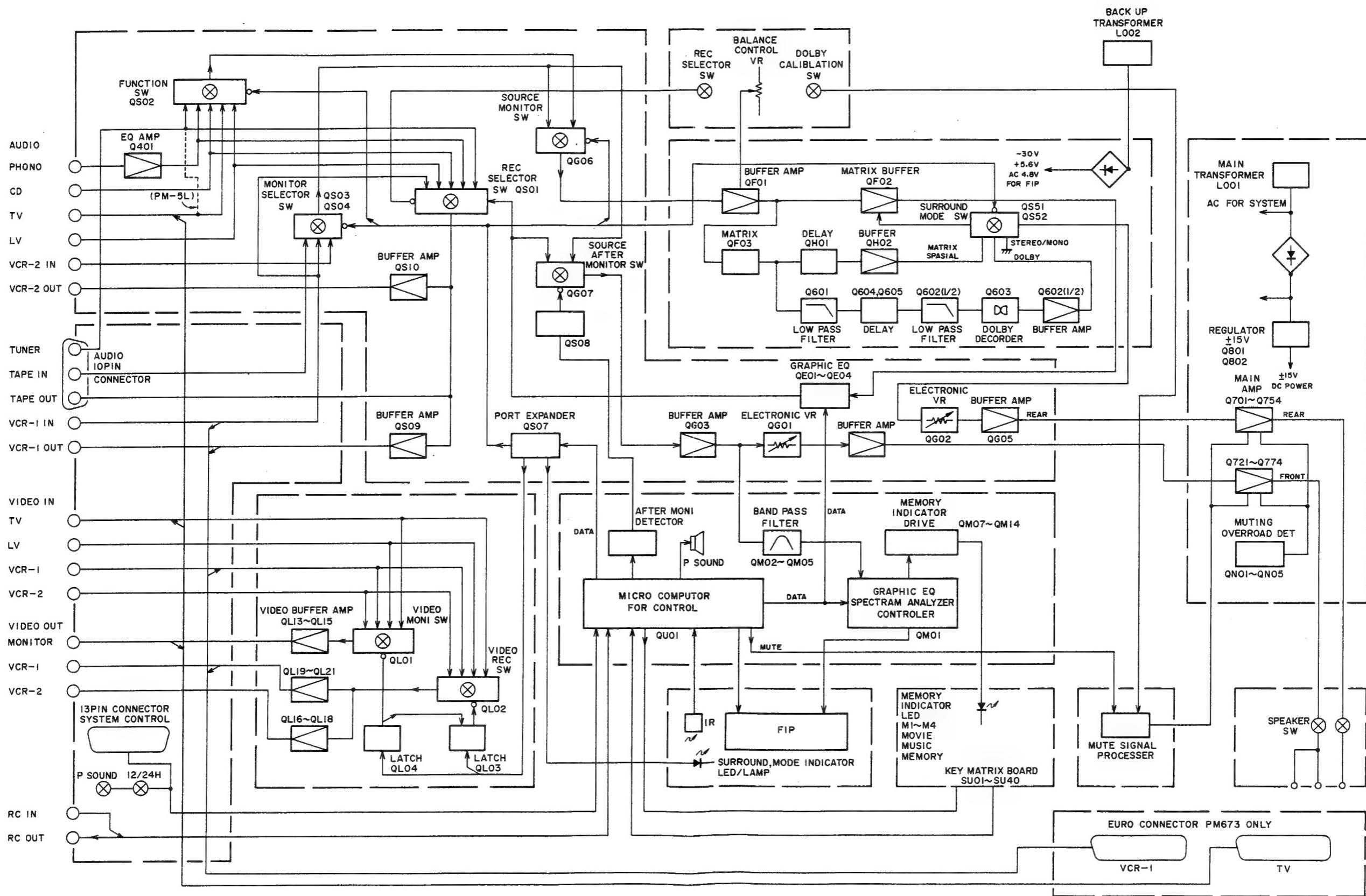
Unit Alone .....	3.0 kg
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## MODEL SD873

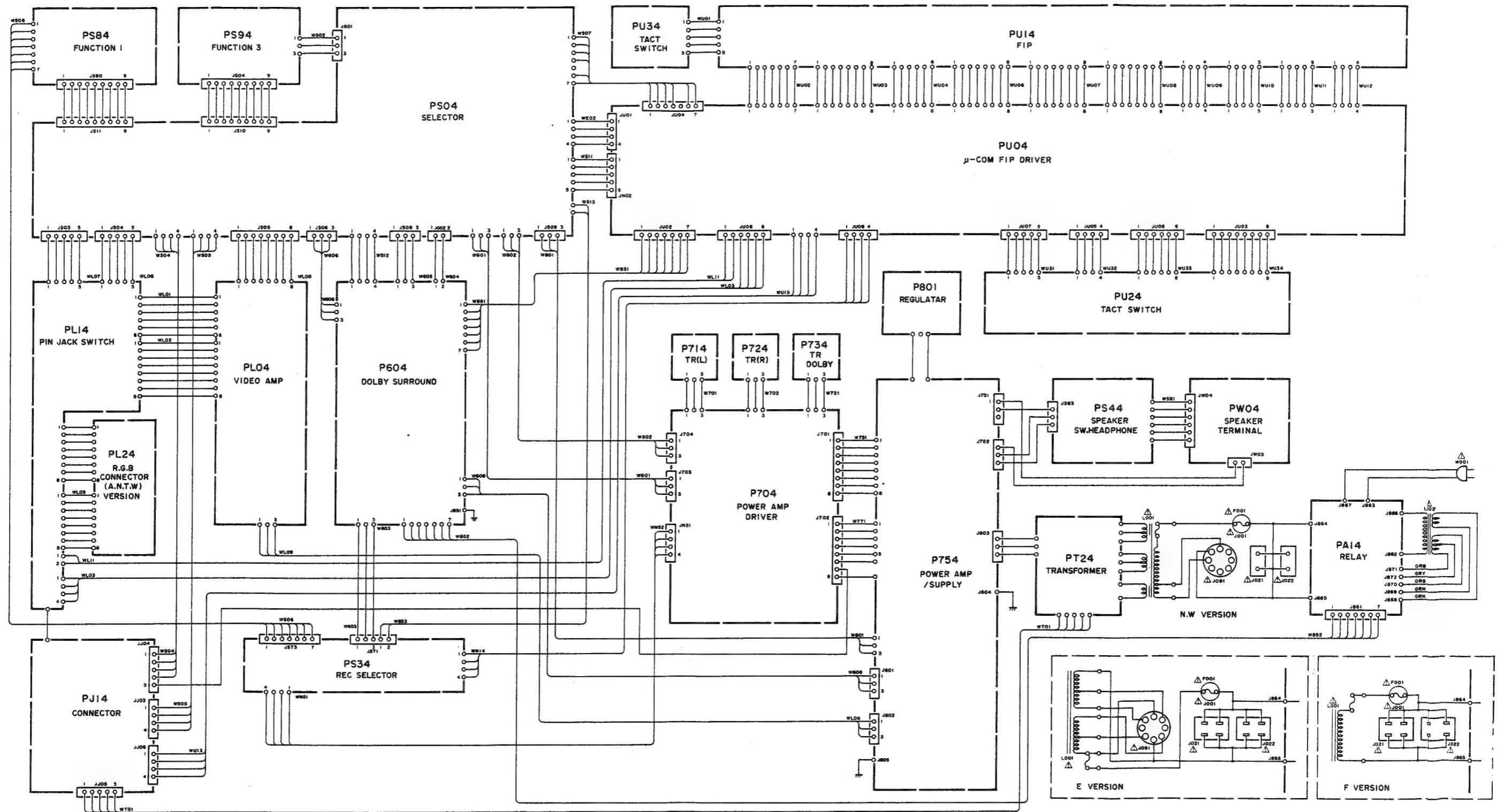
Style . . . . .	Front load
Tape Drive System . . . . .	Single Capstan Drive
Cartridge . . . . .	Philips type compact cassette
Track System . . . . .	Compatible Stereo 4-track 2-channel
Tape Speed . . . . .	4.75 cm/sec
Heads . . . . .	3 Head System
Composition . . . . .	2 Rec/Play: Super Hard Metal Alloy Erase: Dual Gap Ferrite x 1
Motor . . . . .	2 Motor System x 2 Capstan: DC Servo Motor Mechanism: DC Motor
 <b>Overall Frequency Response at -20 dB</b>	
Normal Tape . . . . .	25 Hz ~ 17 kHz
CrO <sub>2</sub> Tape . . . . .	25 Hz ~ 19 kHz
Metal Tape . . . . .	25 Hz ~ 20 kHz
<b>Signal-to-Noise Ratio:</b>	
Dolby B/C (ON) . . . . .	64/73 dB
Dolby (OFF) . . . . .	56 dB
<b>Wow and Flutter</b>	
DIN WTD . . . . .	0.1 %
<b>Outputs</b>	
Line Level/Impedance . . . . .	500 mV/2.2 k ohms
<b>Input (Level at 0 VU)</b>	
Line Sensitivity/Impedance . . . . .	230 mV/40 k ohms
Mic Sensitivity/Impedance . . . . .	0.6 mV/6 k ohms
<b>Fast Rewind Time</b> . . . . .	
. . . . .	95 sec. (C-60)
<b>Fast Forward Time</b> . . . . .	
. . . . .	95 sec. (C-60)
 <b>Power Requirements</b>	
N and T versions . . . . .	220/240 V AC, 50/60 Hz
E version . . . . .	110/120/220/240 V AC, 50/60 Hz
<b>Power Consumption at Rated Output, both Channels Operating</b> . . . . .	
<b>Dimensions</b>	
Panel Width . . . . .	360 mm
Panel Height . . . . .	120 mm
Depth . . . . .	300 mm
Weight . . . . .	4.8 kg

<b>MARANTZ</b> SERVICE BULLETIN		Date: 21-09-1988	Model: PM 673
		Page: 1	NBR: 88-012
Circulation:	Application	Subject:	
for information customer complaint in case of service mandatory .....	W100001 N220001 T100001 A100001 E210001	Change of microprocessor	
		Int. ref: PM673-005	

	<b>Old</b>	<b>Changed into</b>
QU01	uPD75208CW/093 4822 209 71787	uPD75208CW/G-134 4822 209 73844
CN01	470 uF	220 uF/16V 4822 124 41153
RN04	1 MOhm	680 k 4822 116 52298
RN59	1 MOhm	470 k 4822 116 52285



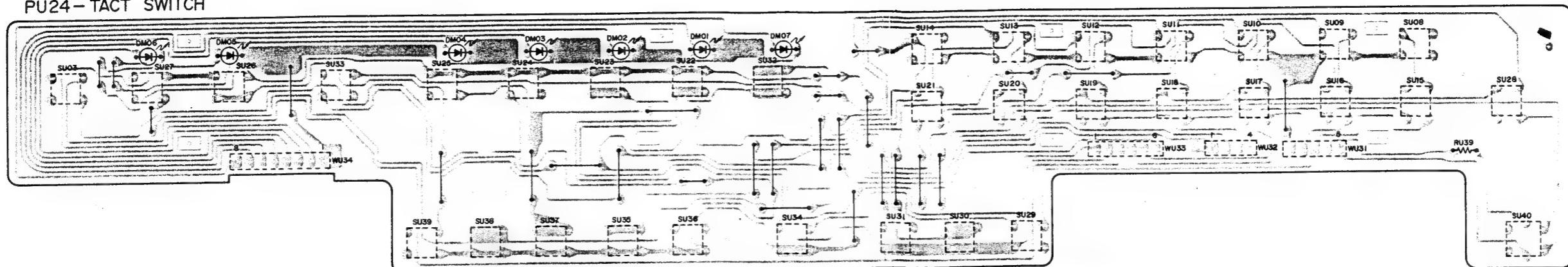
PM-5L/PM673



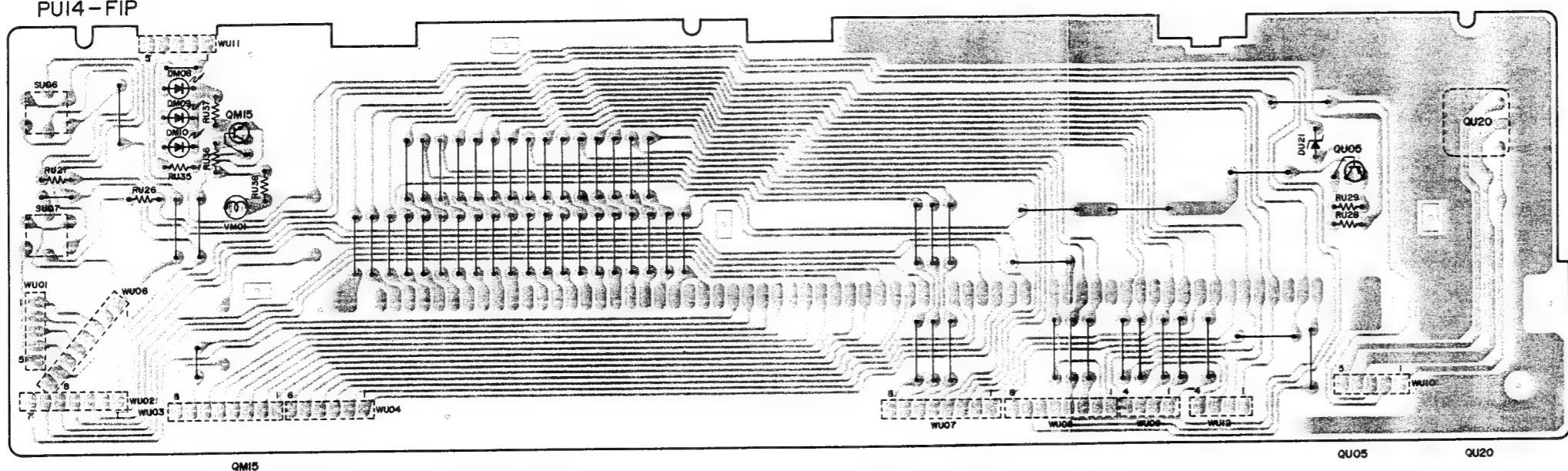
PM-5L / PM673

MZ 1980

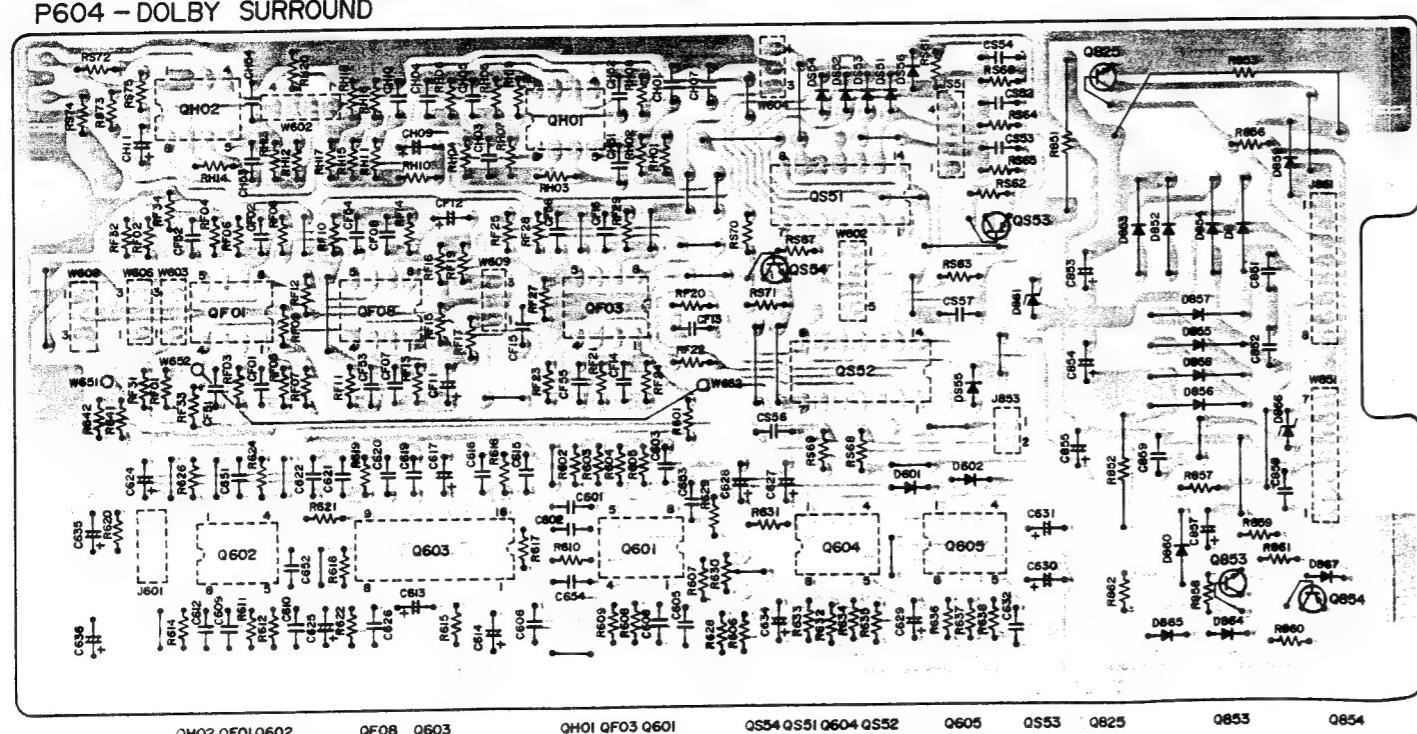
PU24 - TACT SWITCH



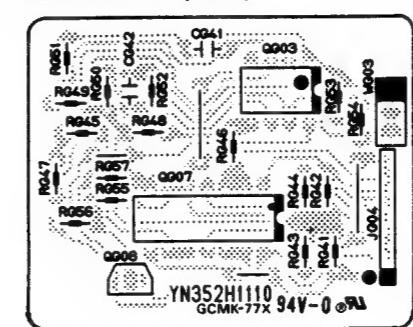
PUI4 - FIP



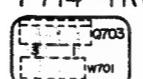
P604 - DOLBY SURROUND



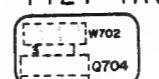
Power Switch (PS94)



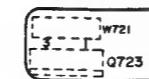
P714-TR(L)



P724-TR(R)



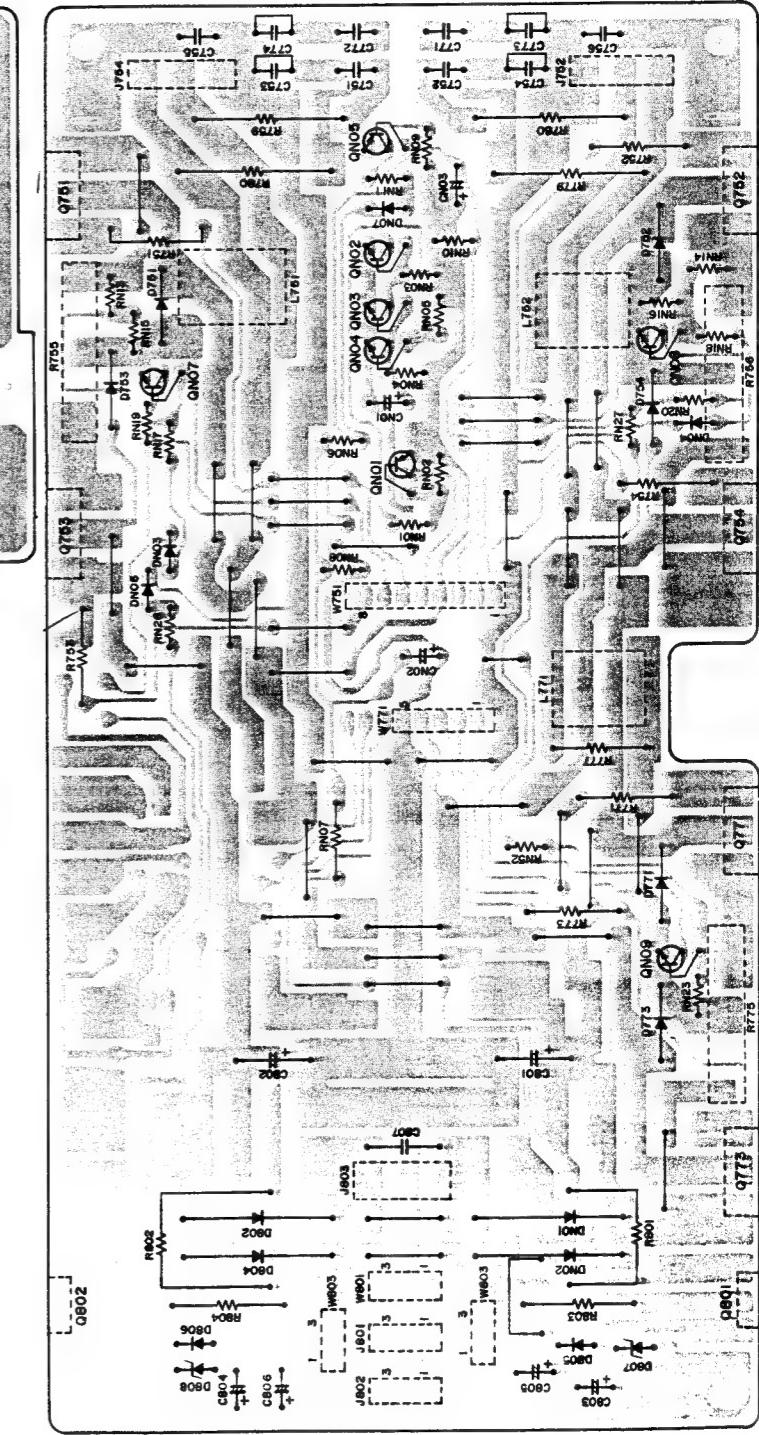
P734-TR DOLBY

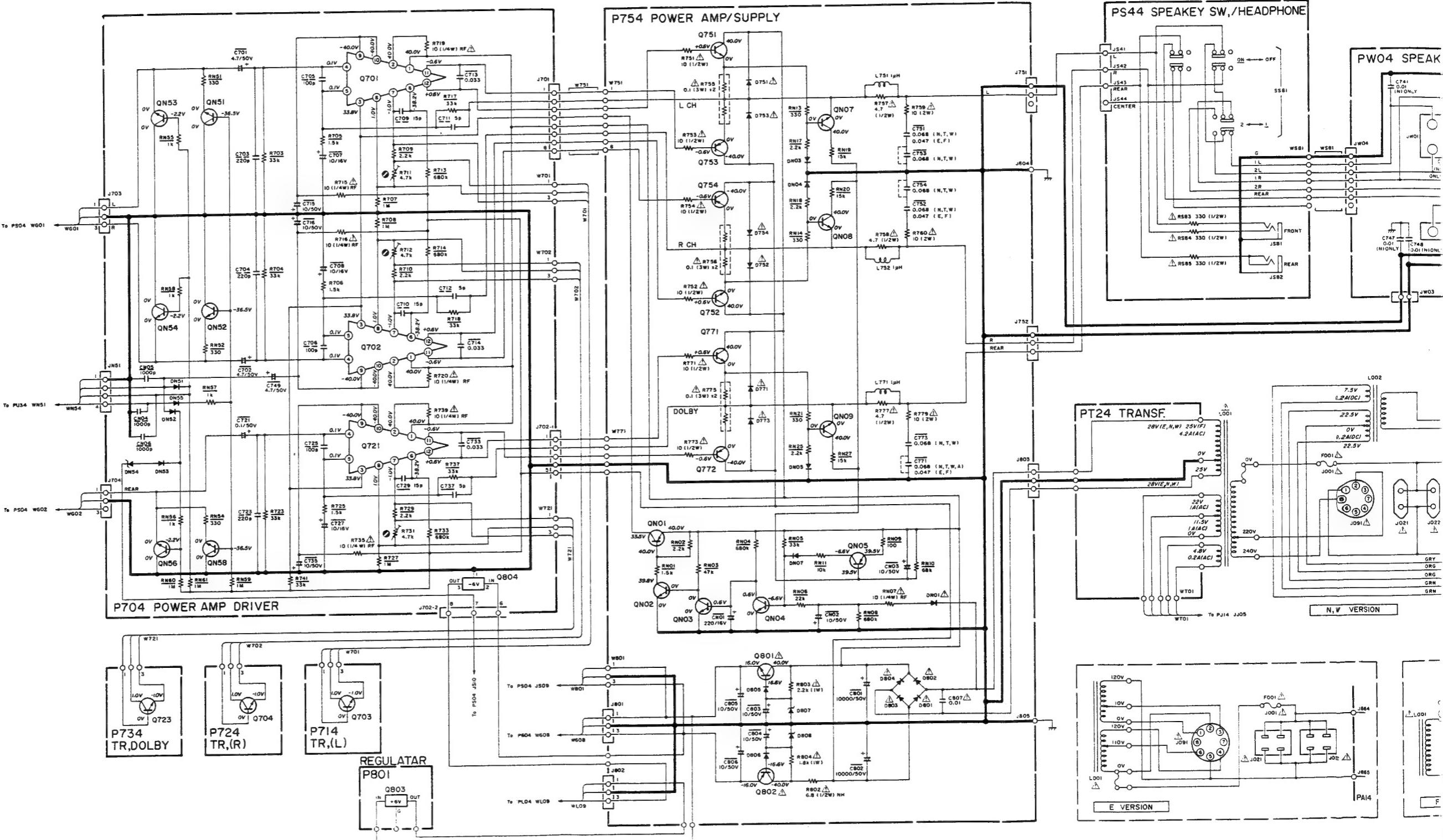


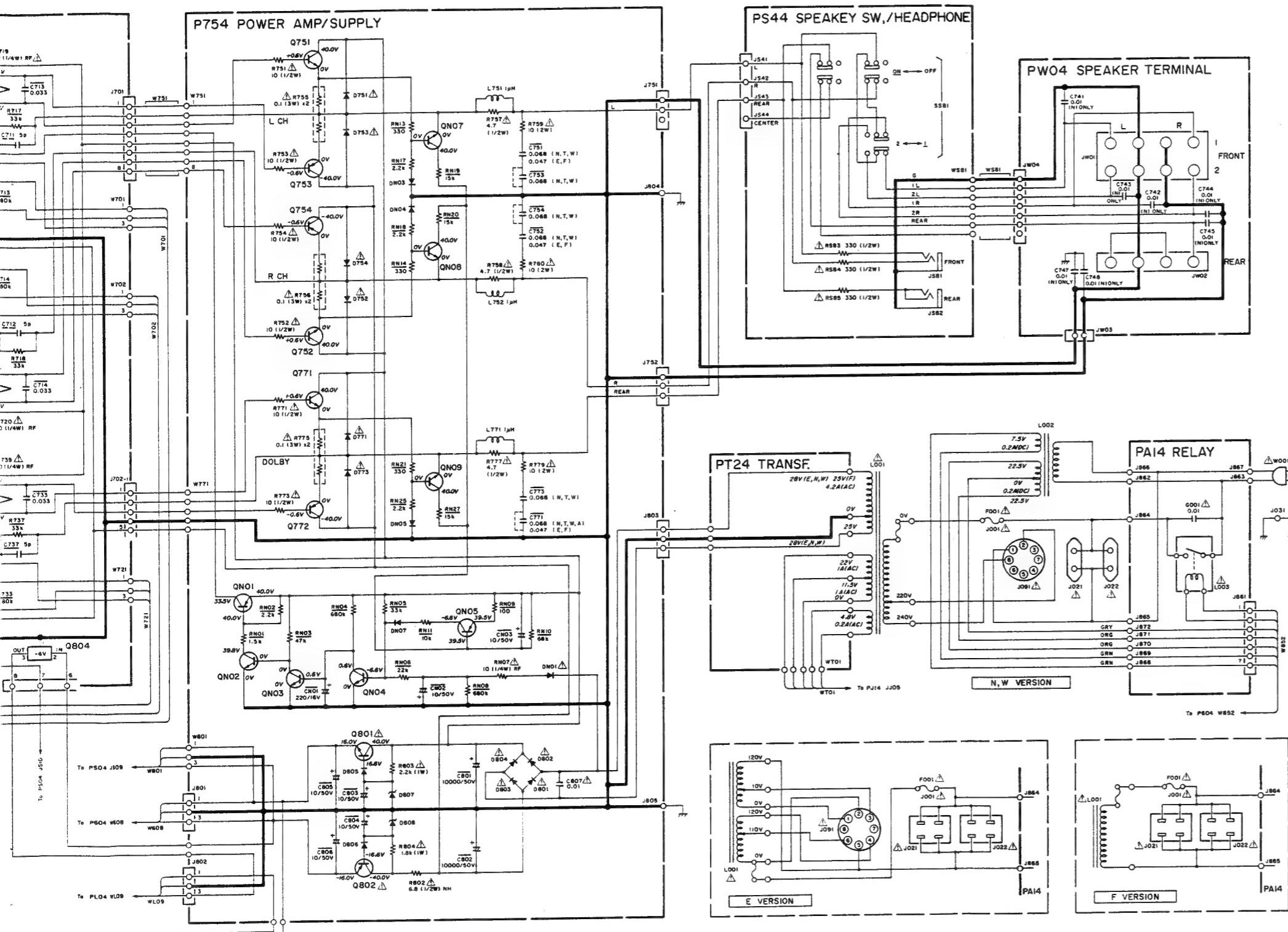
P801-REG.



P754 - POWER AMP / SUPPLY







SCHEMATIC DIAGRAM OF PM673 (4/4) PM-5L

Q701,Q702,Q721	D751~D754,D771
HC10114060	D773,DN01,DN02
$\mu$ PC1270H	HD20003000
	DSF10C,etc.

Q703, Q704, Q723  
HT334191Y0  
2SC3419(Y)

Q751,752,Q771  
 HT41714280  
 2SD1714(S,P) D805,D806  
 DN03~DN05,DN07  
 DN51~DN53  
 HD20002000

Q735,4734,871C  
HT211592B0  
2SB1159(S,P)  
  
0801  
0807,0808  
H031601000  
16V

HT412652AO  
2SD1265(R,P) DN54  
Q802 HD31201000  
12V

2SA1306(0,Y)  
Q803  
HC38506090  
NJM78M06A

QNO1  
HT10001000  
2SA608SP(G)

QNO2, QNO7~QNO9  
HY327852D0  
2SC2785(EE EE)

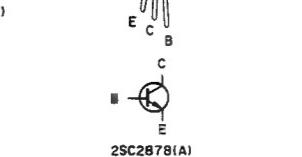
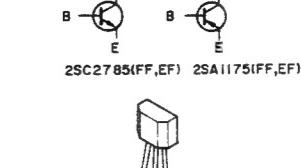
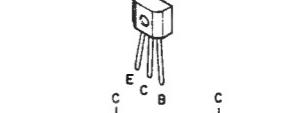
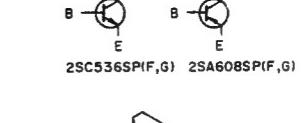
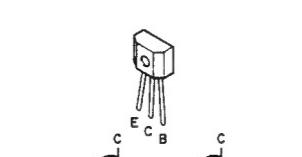
QNO3, QNO4  
HT30001000  
2SC536SP(E G)  
B C -

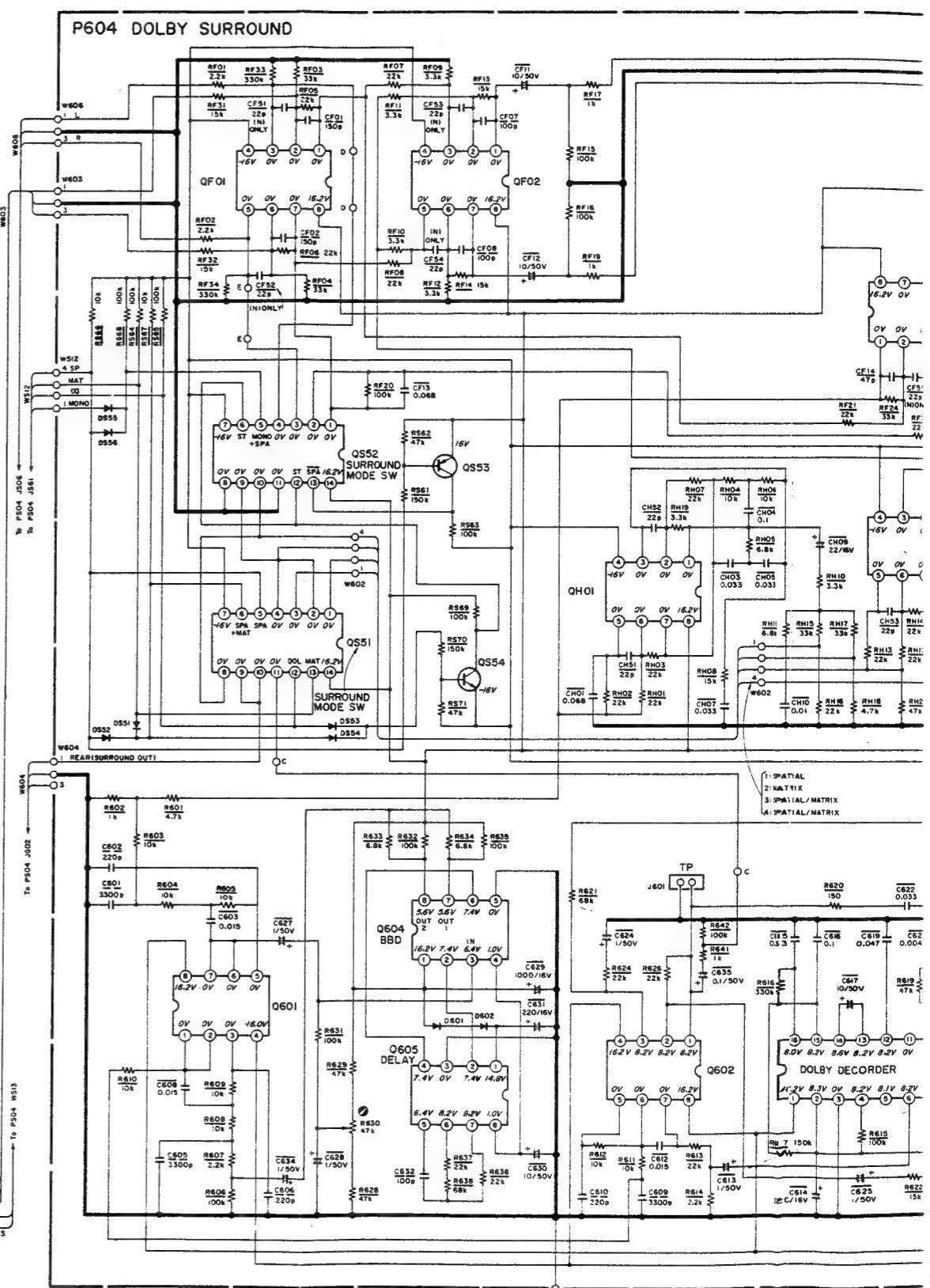
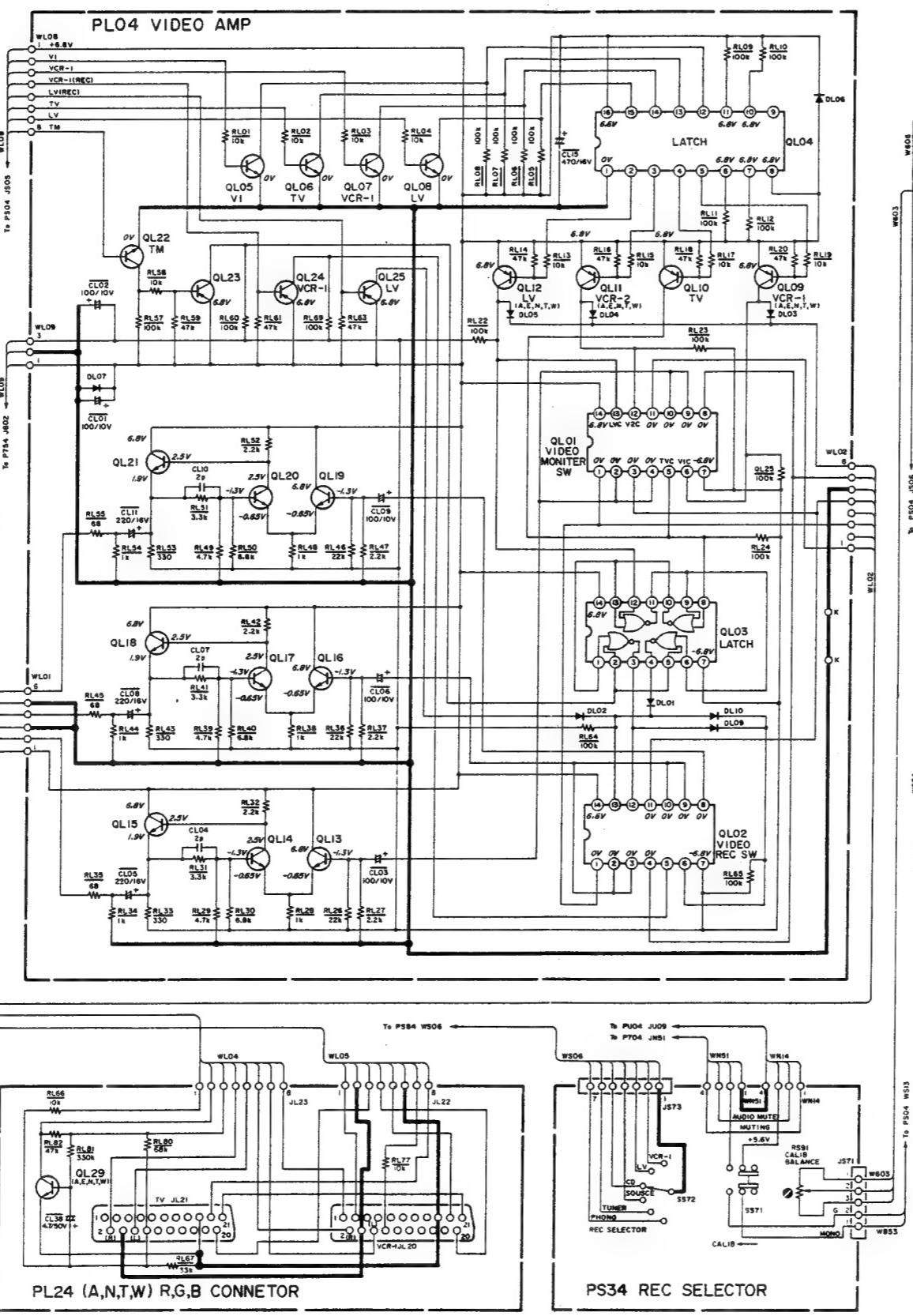
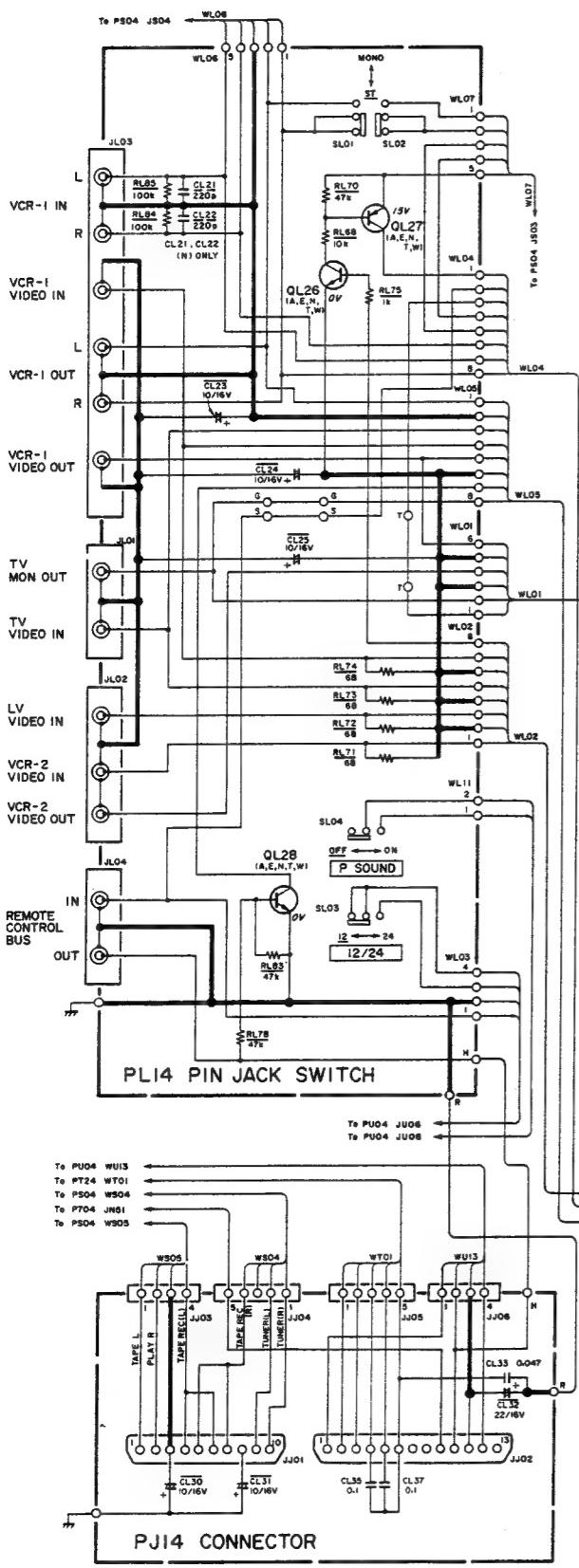
QN05 C

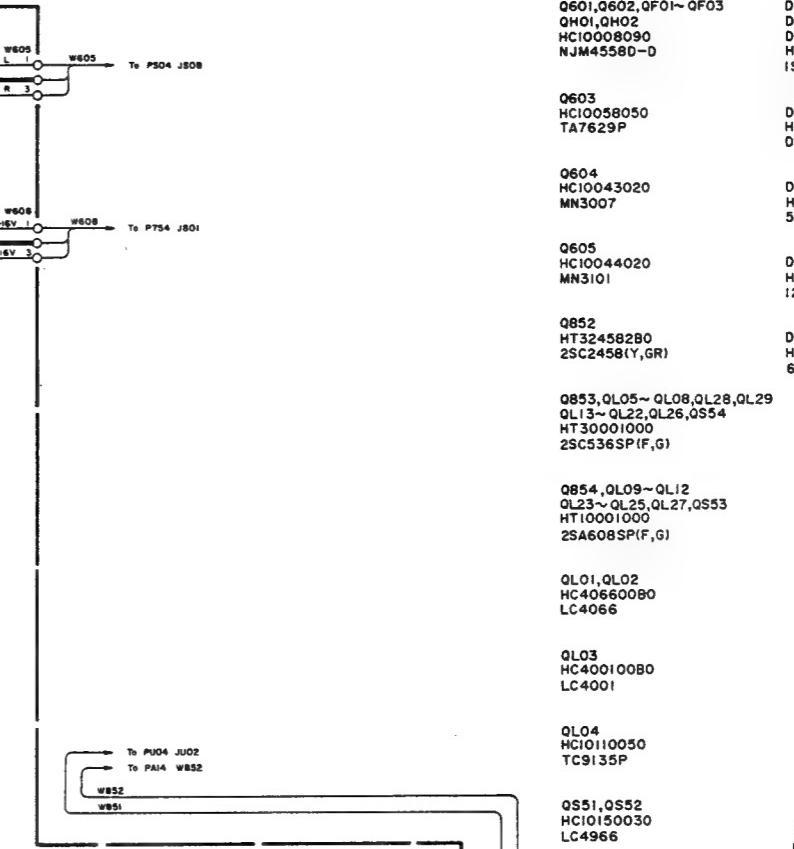
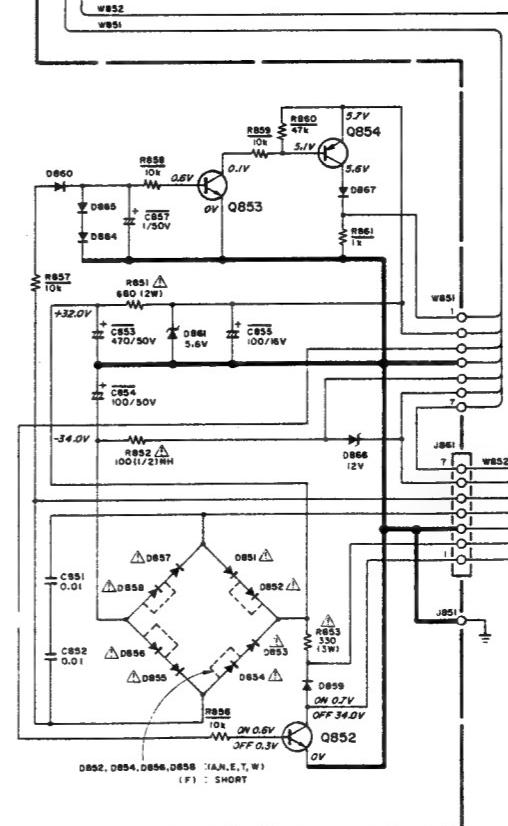
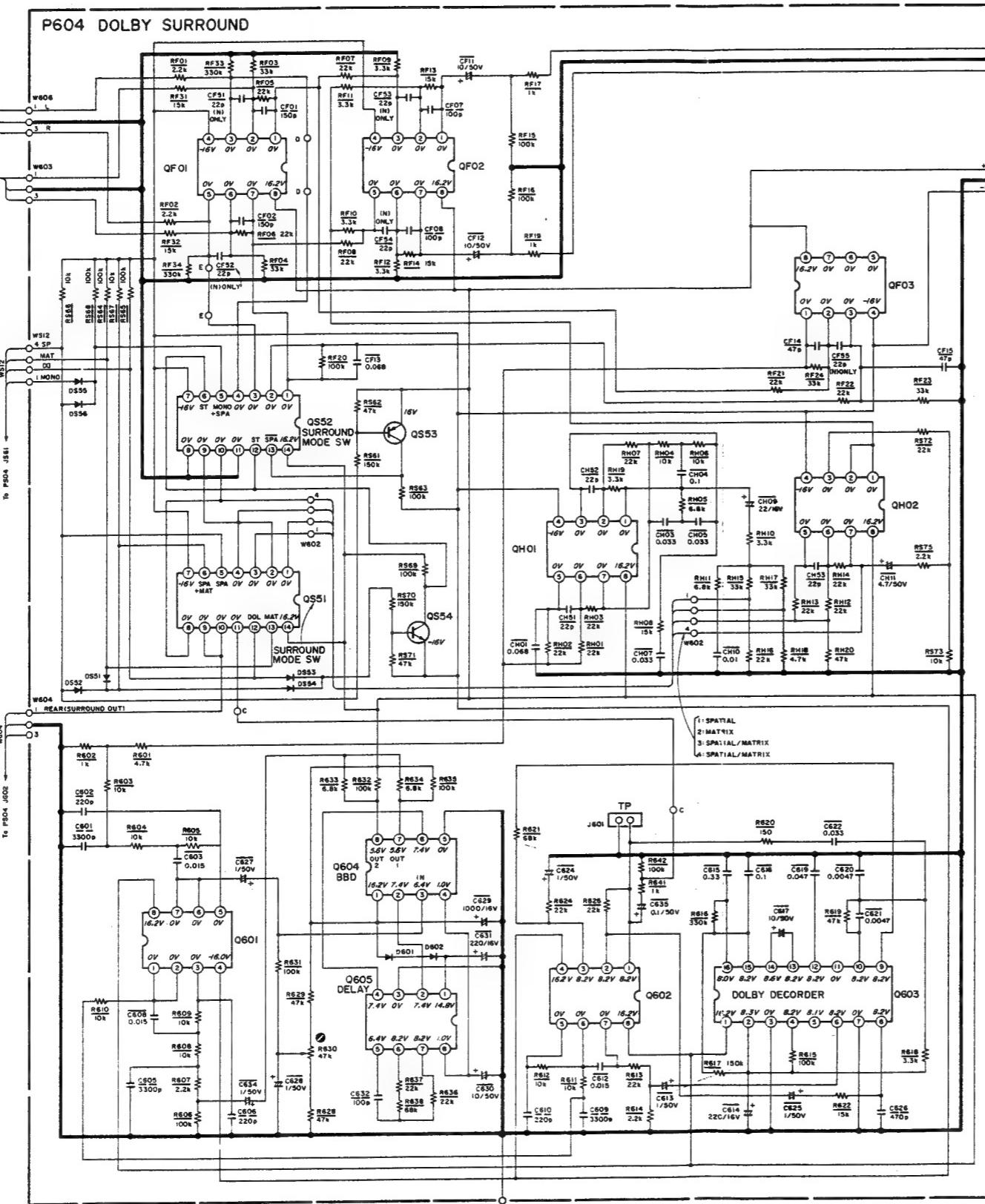
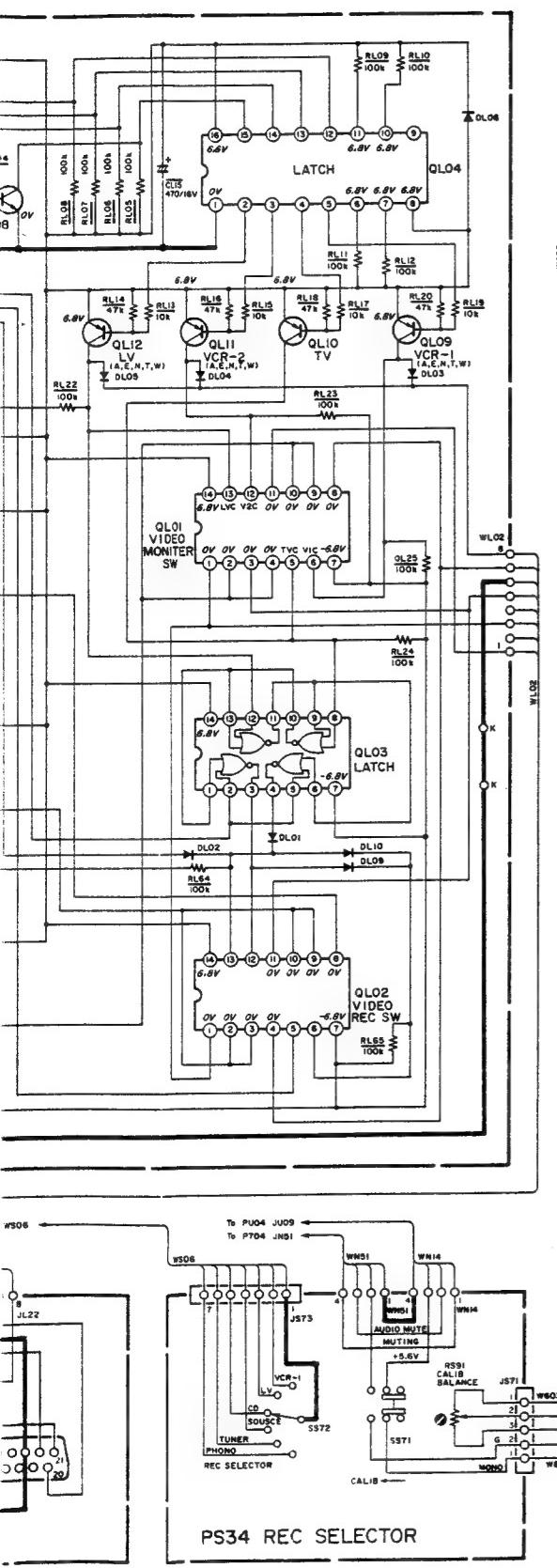
2SA1175(FF,EF)

QNS1~QNS4,QNS8  
QNS8  
HT32878IAO  
2SC2878(A)

Q804  
HC39506090  
NJM79M06







Q601, Q602, QF01~QF03  
QH01, QH02  
HC10008090  
NJM4558D-D  
ISS133, etc.

D851~D860  
HD20003000  
OSF10C, etc.

Q603  
HC10058050  
TA7629P

Q604  
HC10043020  
MN3007

Q605  
HC10044020  
MN3101

Q666  
HD31201000  
12V

Q852  
HT32458280  
ZSC2458(Y,GR)

TOP VIEW

8 5

QL01, QL02  
HC4066080  
LC4066

QL03  
HC40010080  
LC4001

QL04  
HC10110050  
MN3007  
MN3101

QS51, QS52  
HC10150030  
LC4966

TOP VIEW  
14 8

LC4966  
TOP VIEW

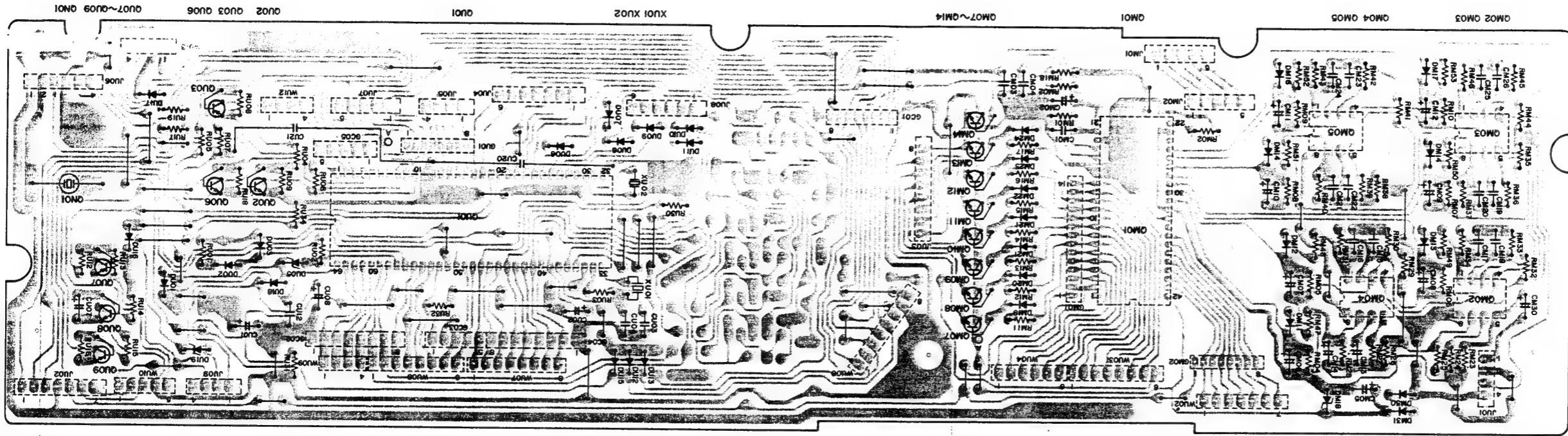
LC4001  
LC4066  
TOP VIEW  
8 7

2SC536SP(F,G)  
2SA608SP(F,G)

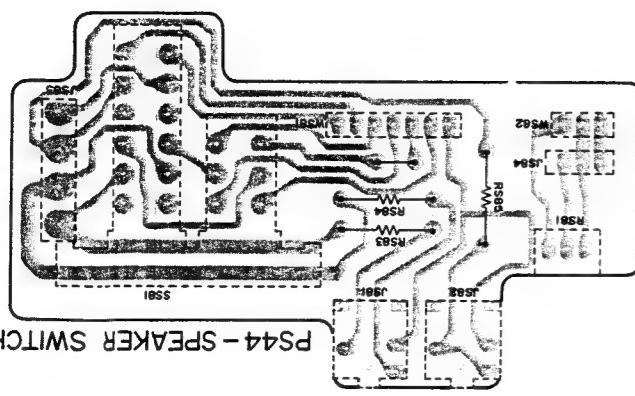
TA7629P  
TA9135P  
TOP VIEW  
16 9

TA9135P  
TOP VIEW  
8 7

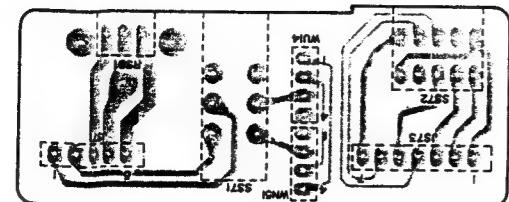
2SC2458(Y,GR)



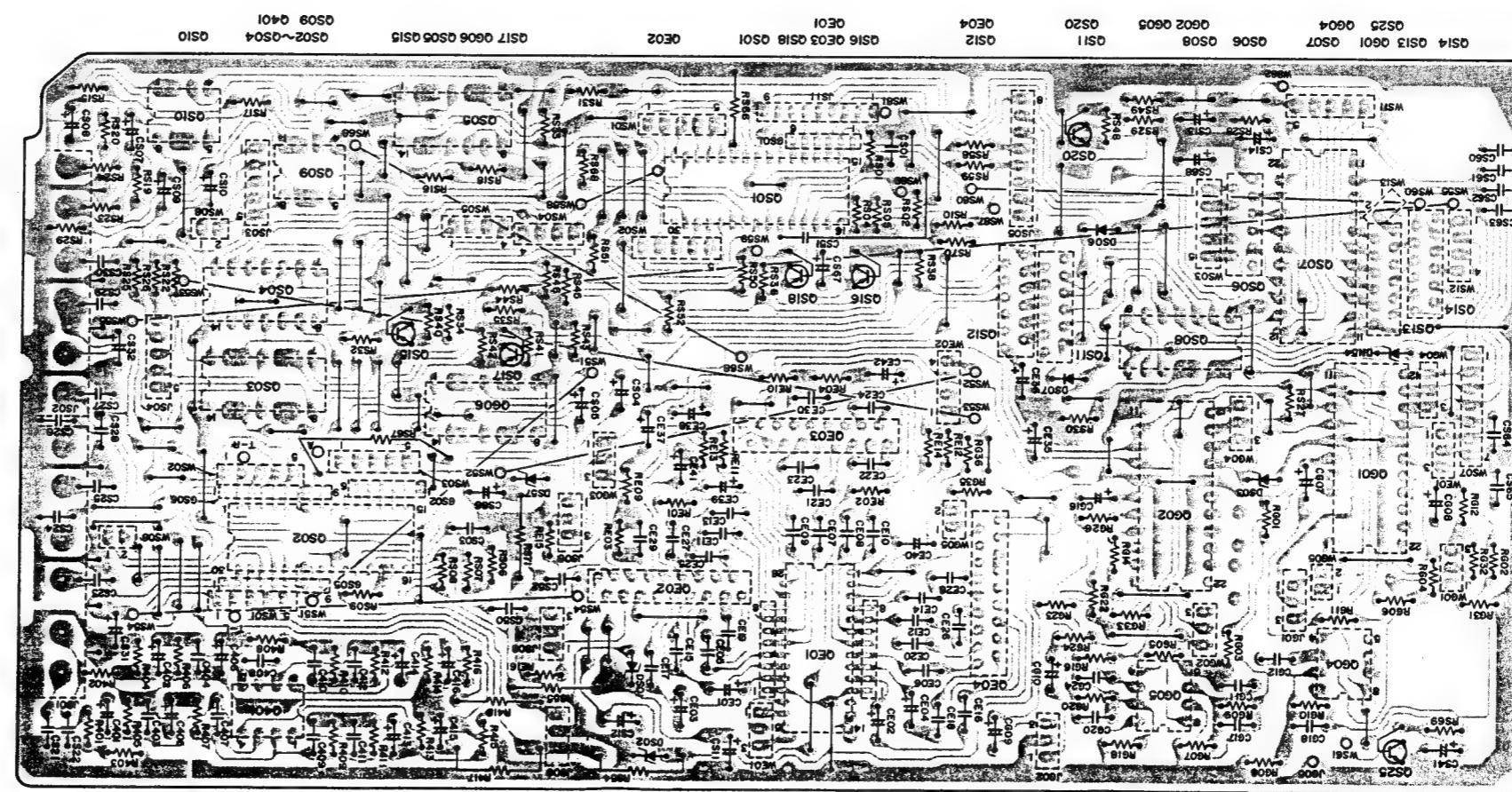
PUB4 - JU-COM



PS44 - SPEAKER SWITCH

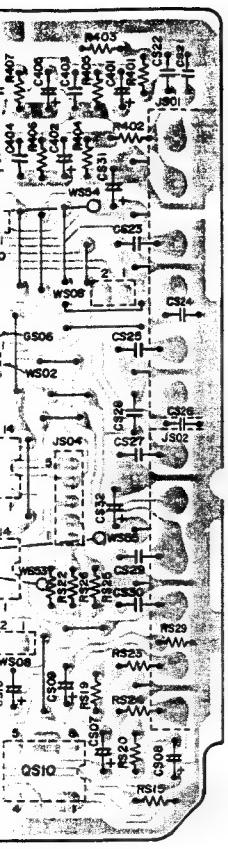
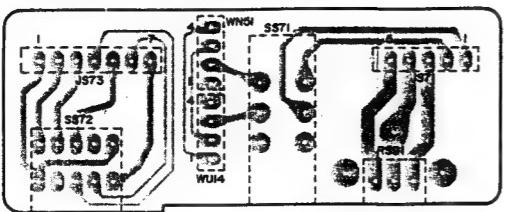


PS34-REC SELECTOR

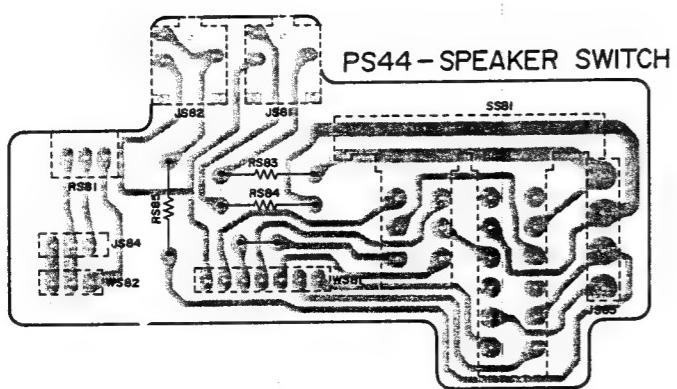


PSO4 - SELECTOR

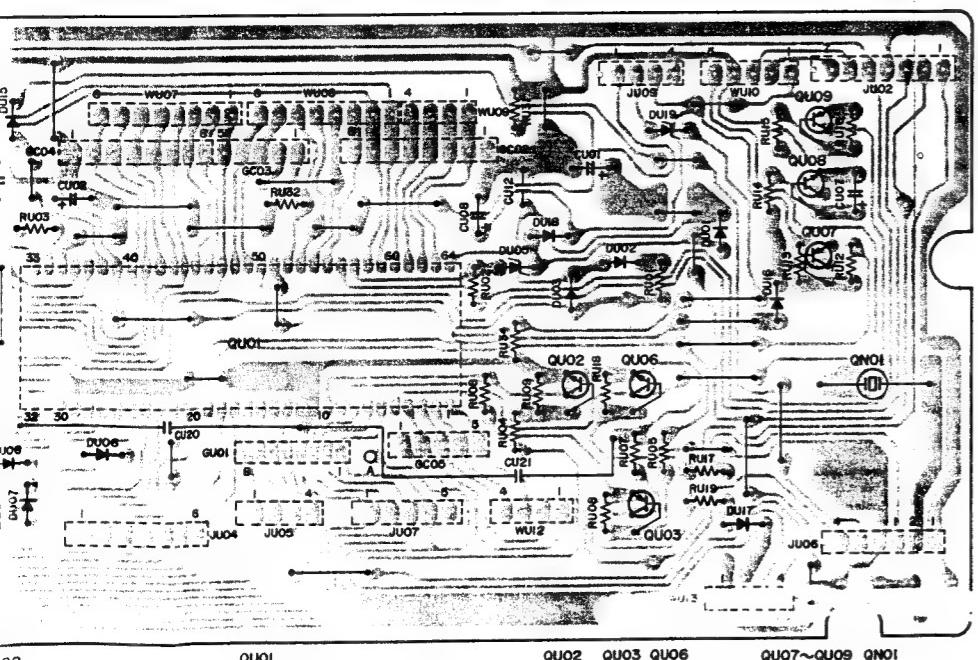
PS34 - REC SELECTOR



PS44 - SPEAKER SWITCH



QS10



02

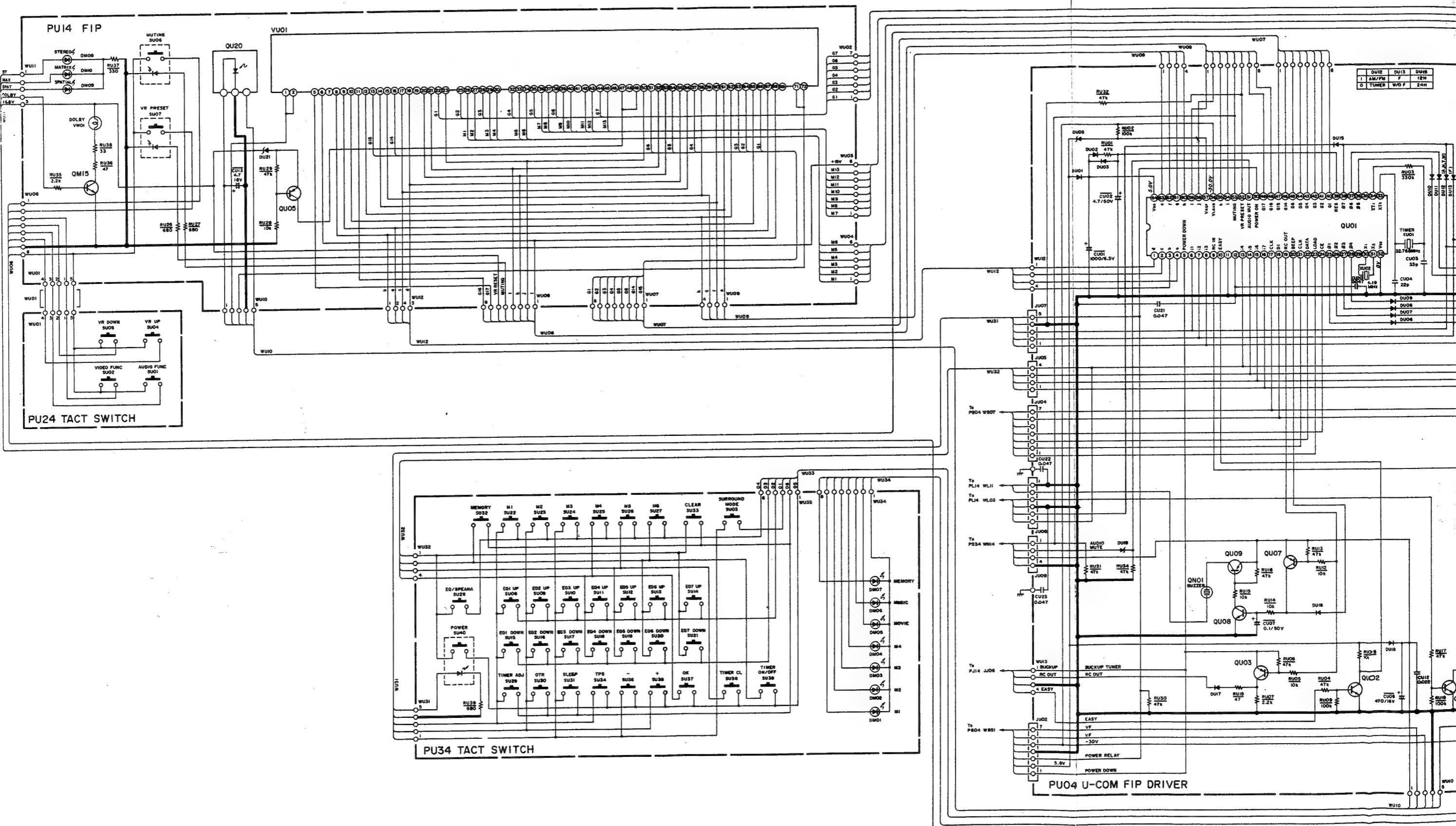
Q01

Q02

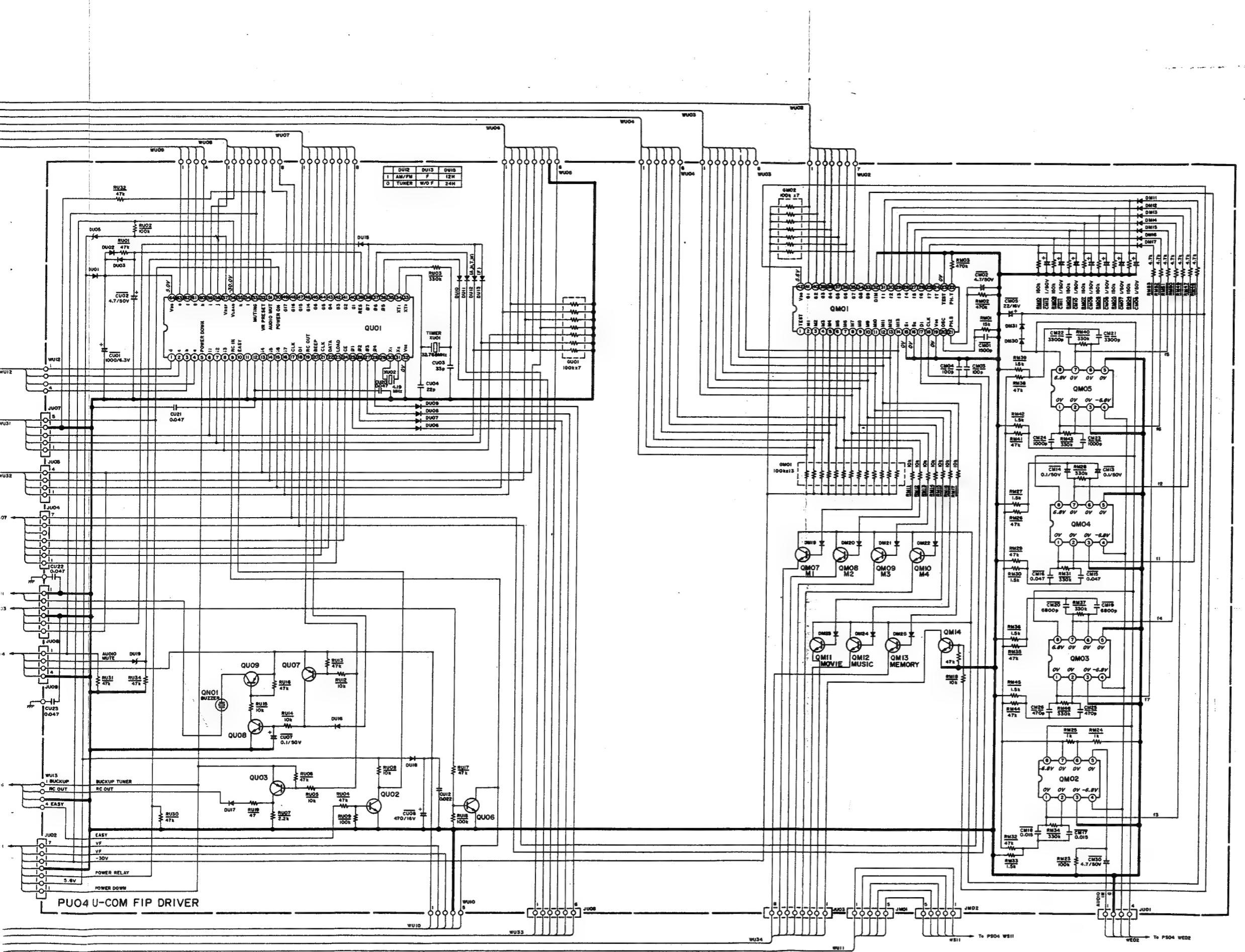
Q03

Q06

Q09-Q09~Q09

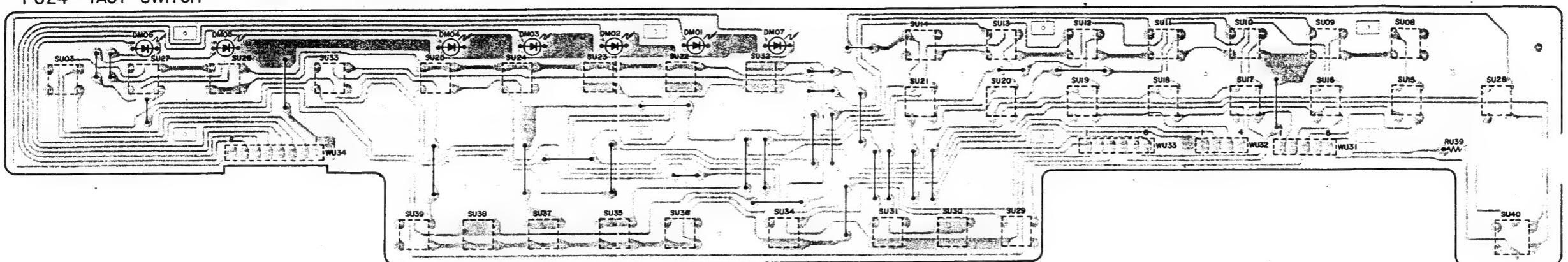


PM-5L  
SCHEMATIC DIAGRAM OF PM673 (3/4)



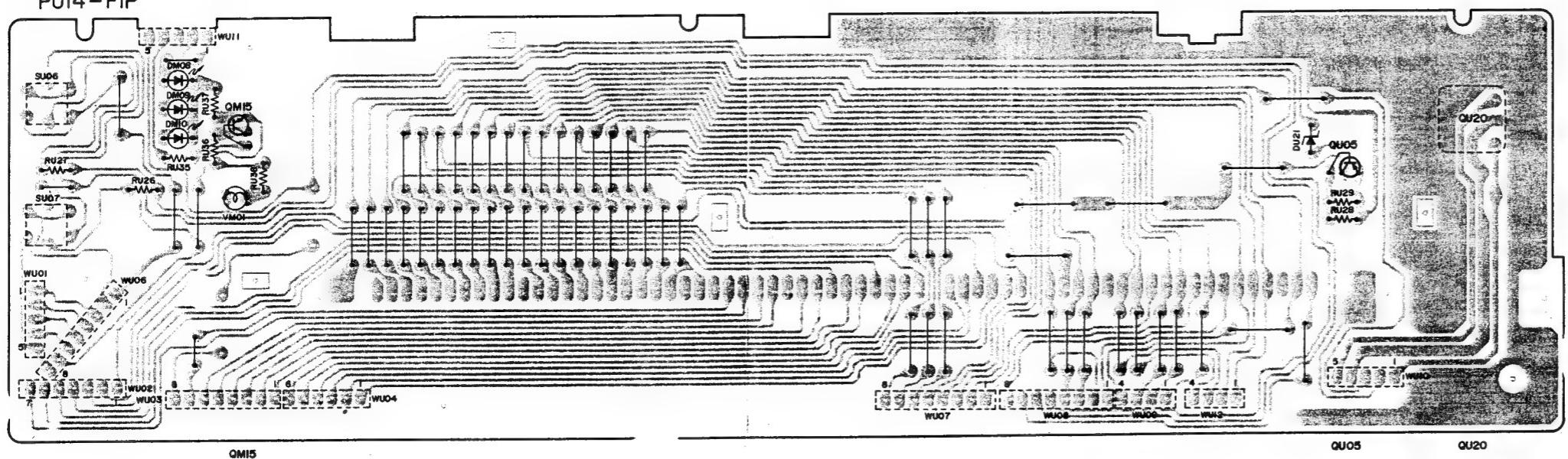
## PU04 U-COM FIP DRIVER

## PU24 – TACT SWITCH

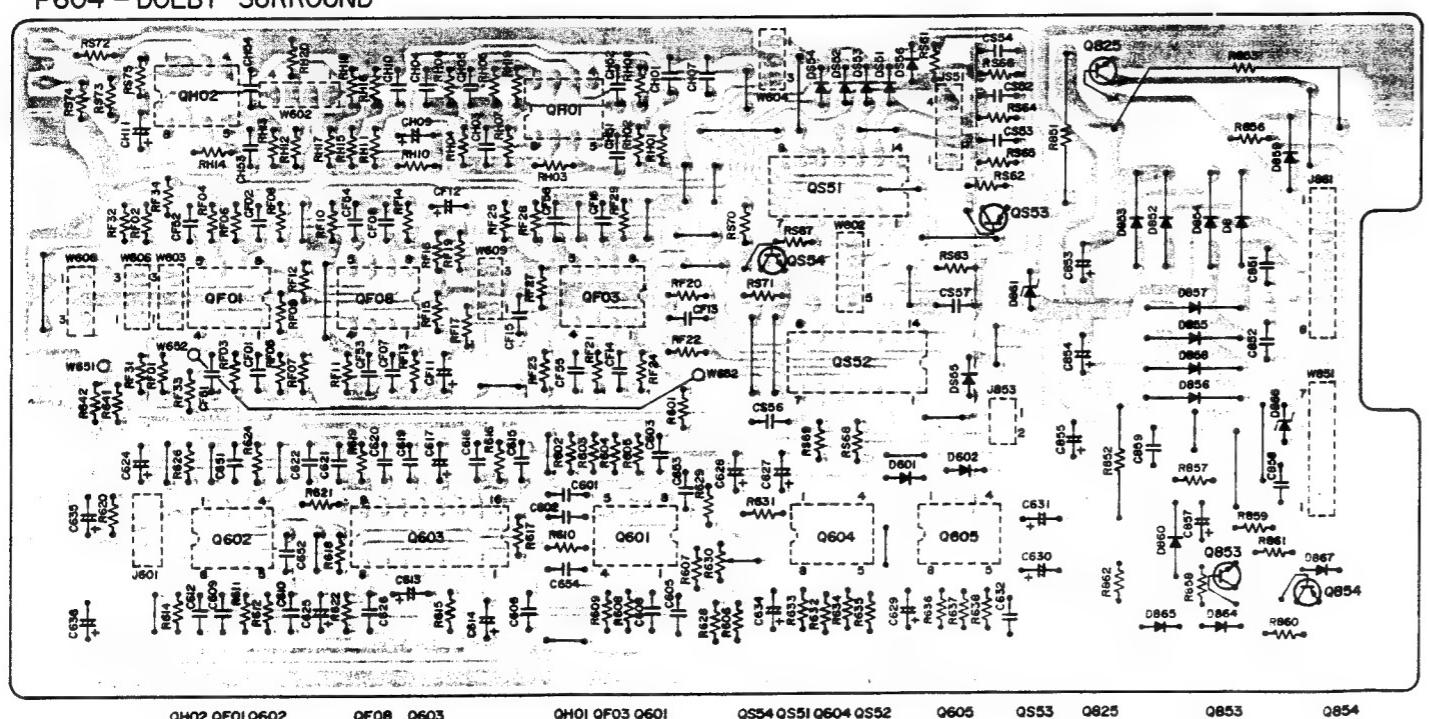


## P754 - POWER AMP/SUPPLY

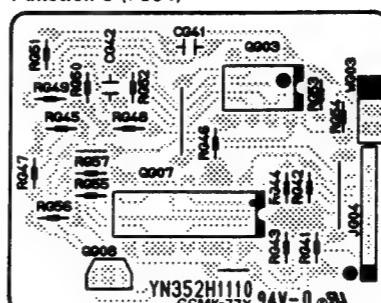
PUI4 - FIP



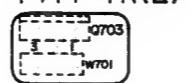
P604 - DOLBY SURROUND



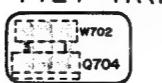
### Function 3 (PS94)



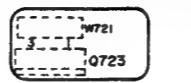
P714-TR(L)



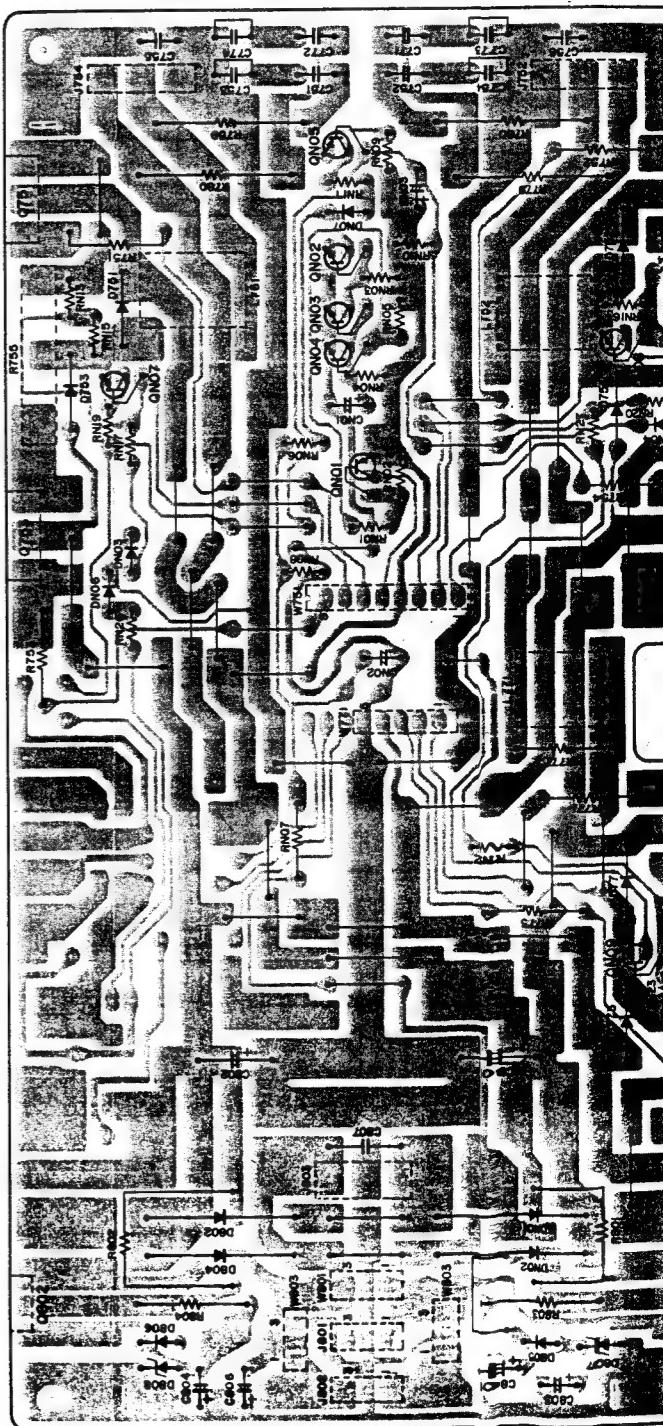
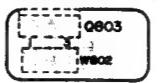
P724-TR(R)

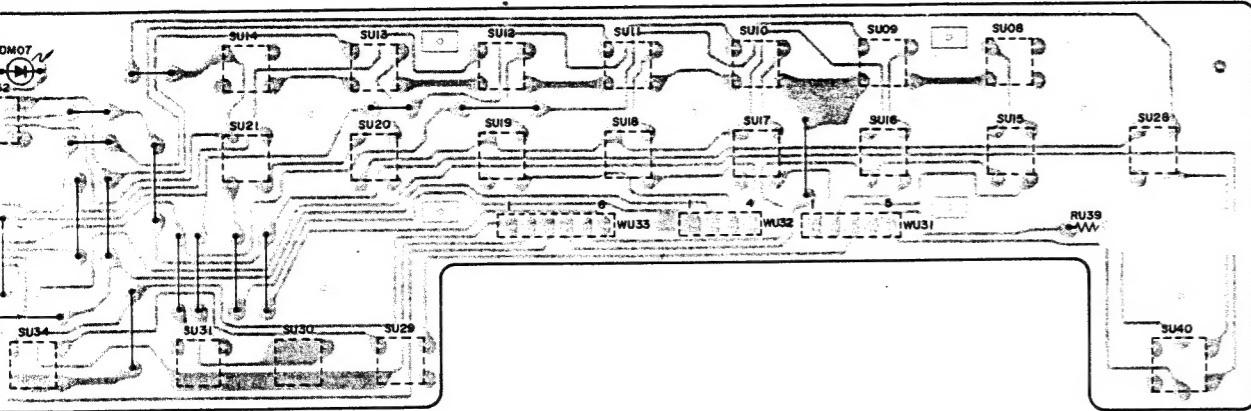


P734 - TR DOLBY

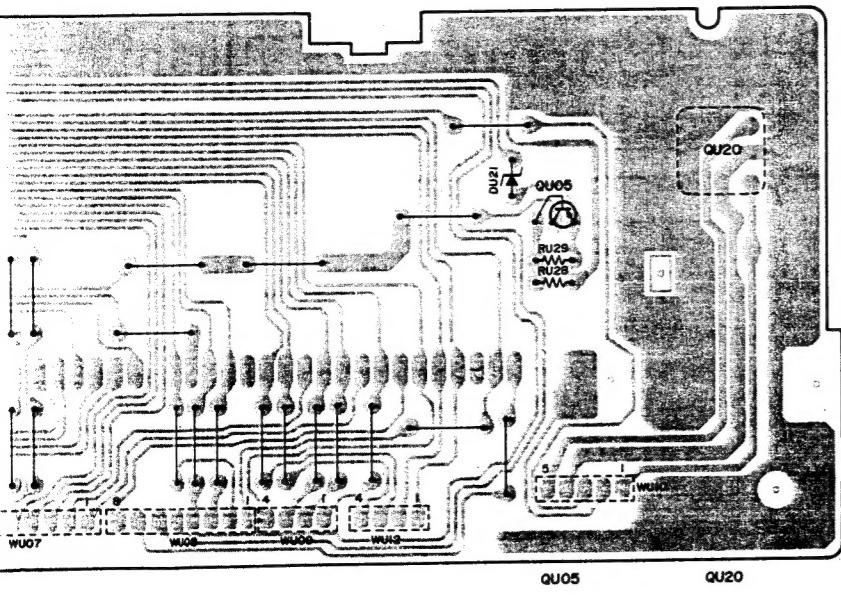


P801 - REG.

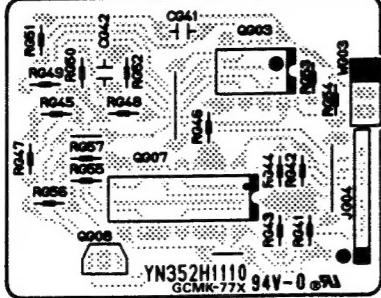




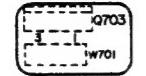
P754 - POWER AMP/SUPPLY



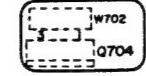
### Function 3 (PS94)



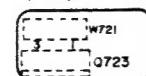
P7I4-TR(L)



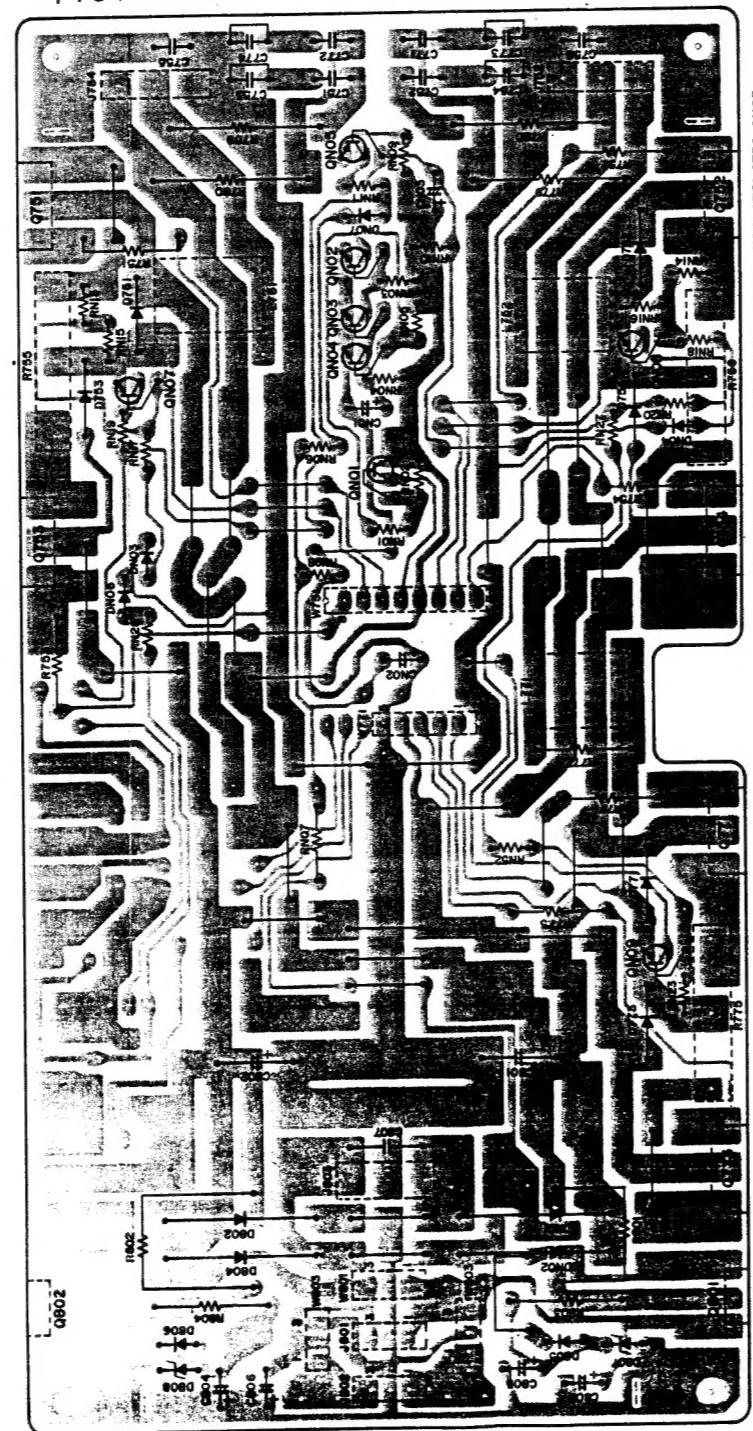
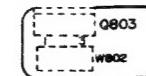
P724-TR(R)

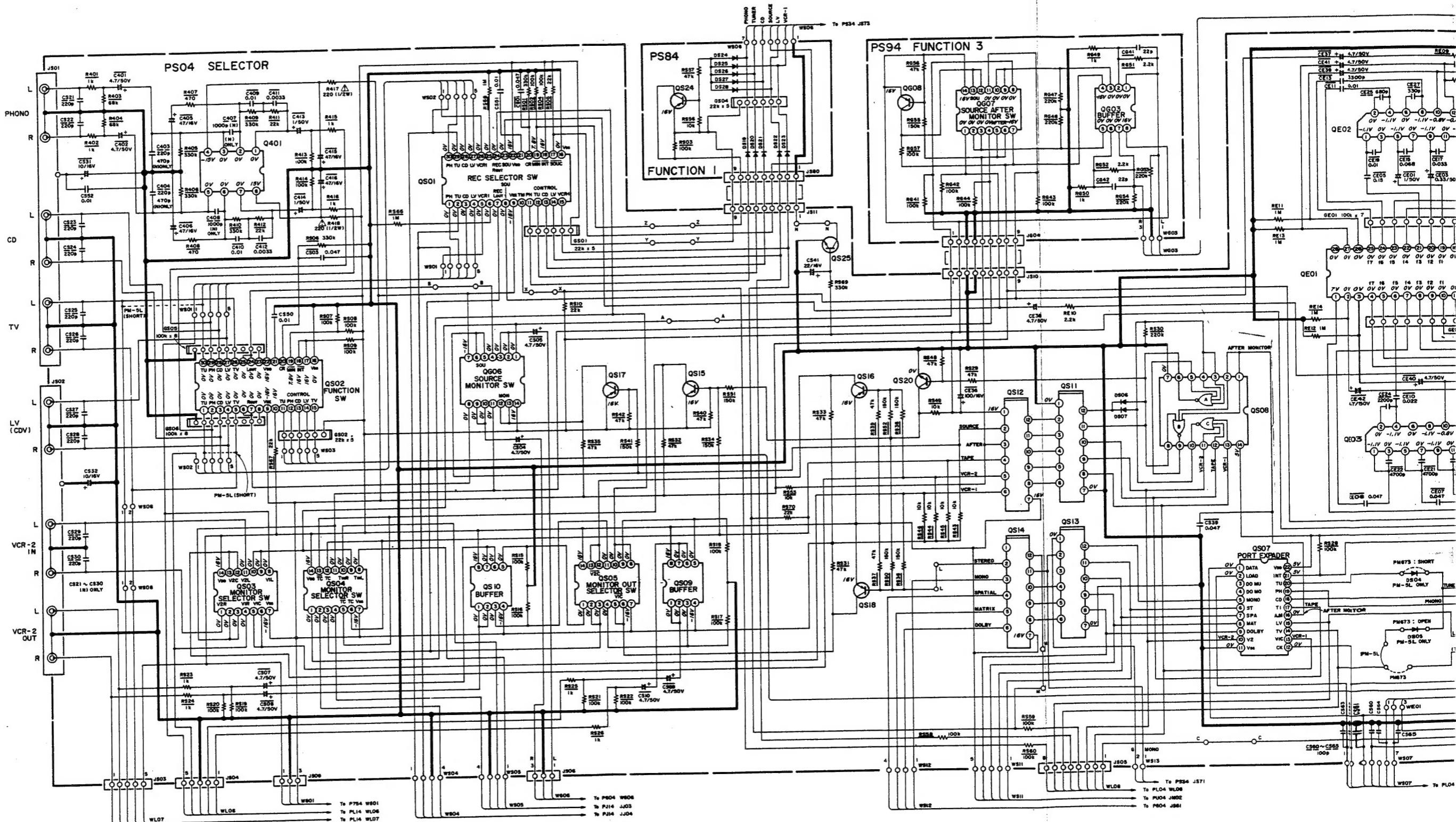


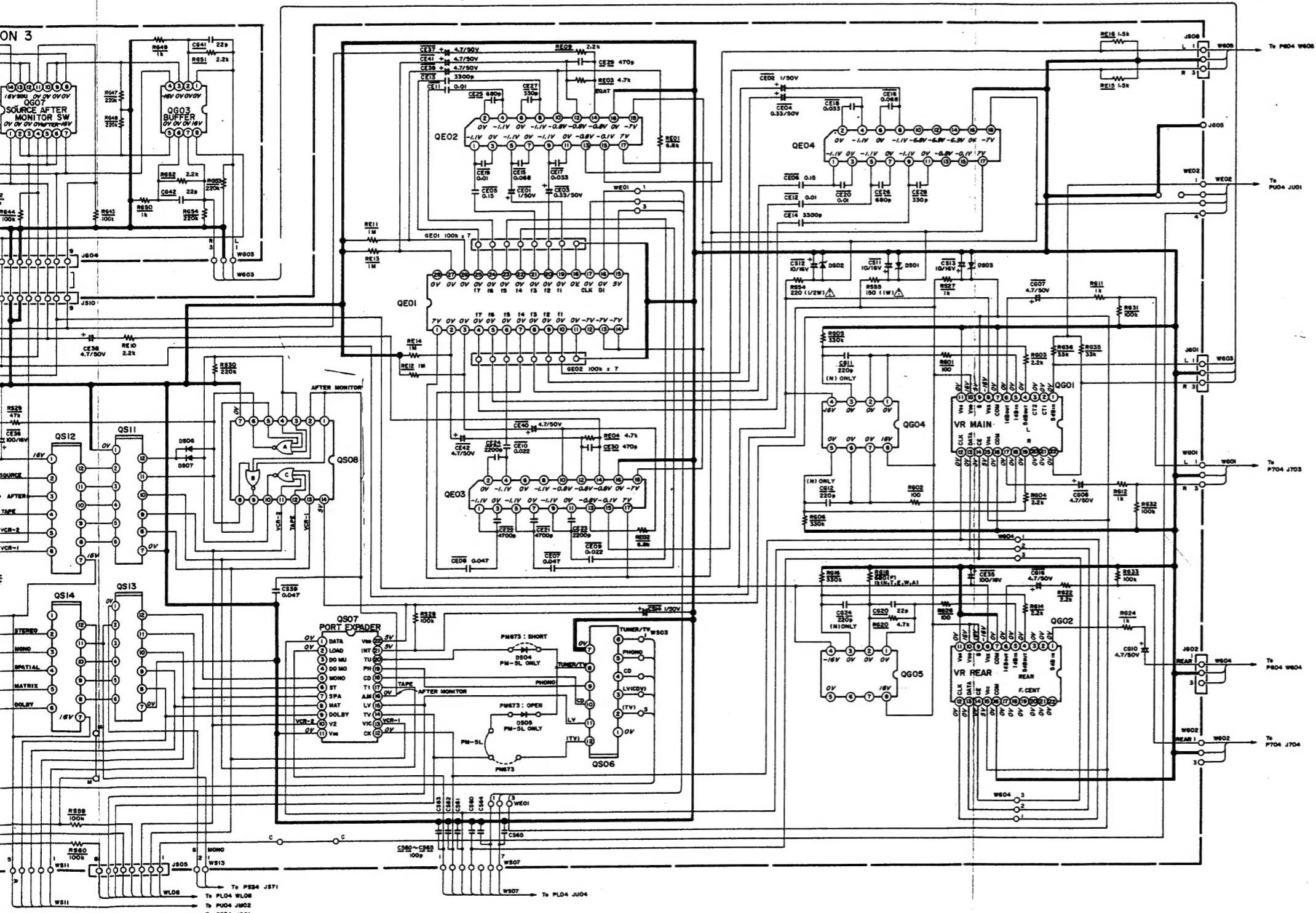
P734 - TR DOLBY



P801 - REG.

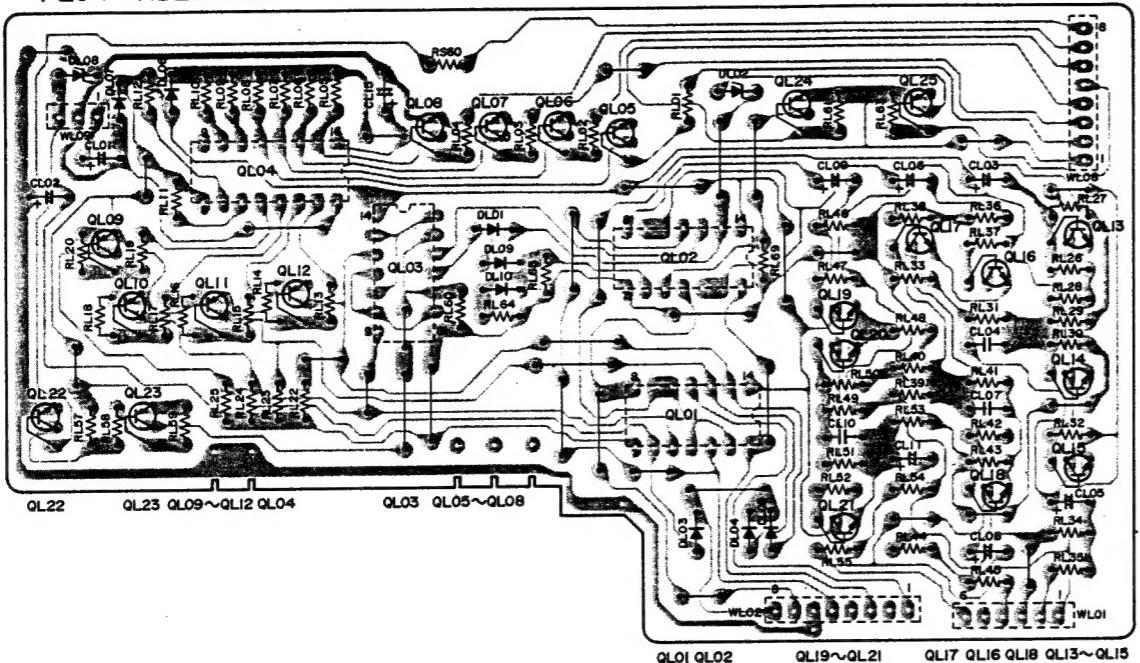




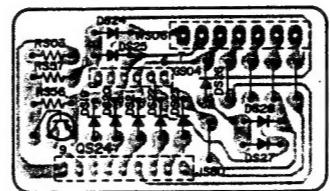


#### SCHEMATIC DIAGRAM OF PM673 / PM-5L (1/4)

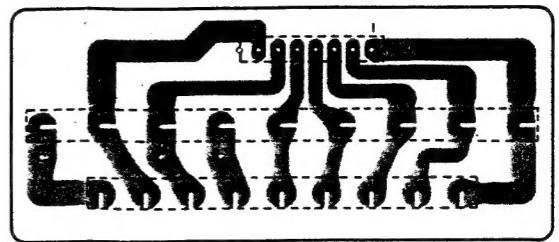
PLO4-VIDEO AMP



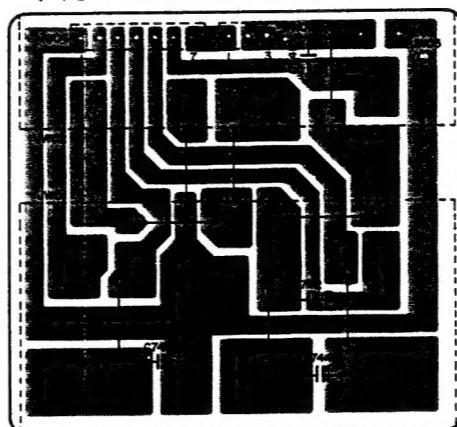
PS84 – FUNCTION



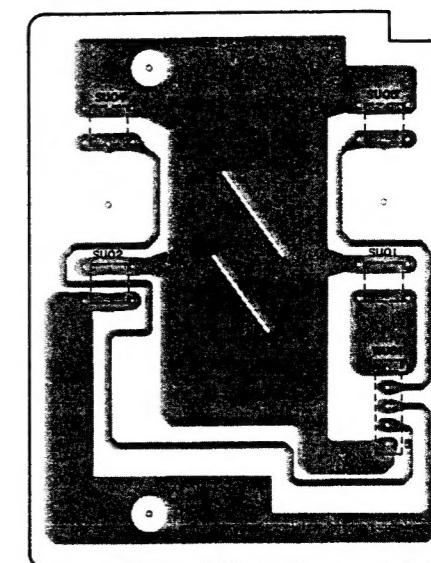
PT24 - TRANSF.



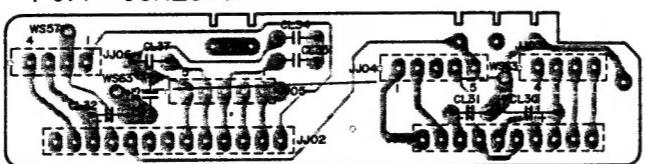
**PT04-SPEAKER TERMINAL**



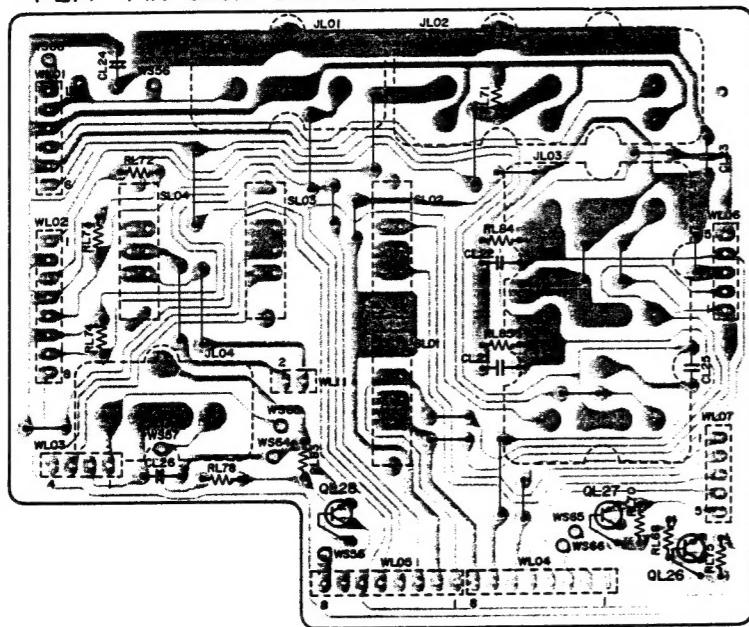
PU34 - TACT SWITCH



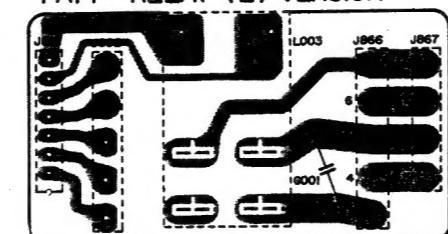
PJI4 – CONECTOR



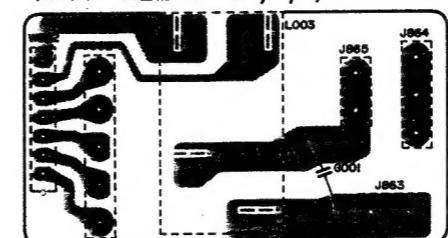
### **PLI4 - PIN JACK SWITCH**



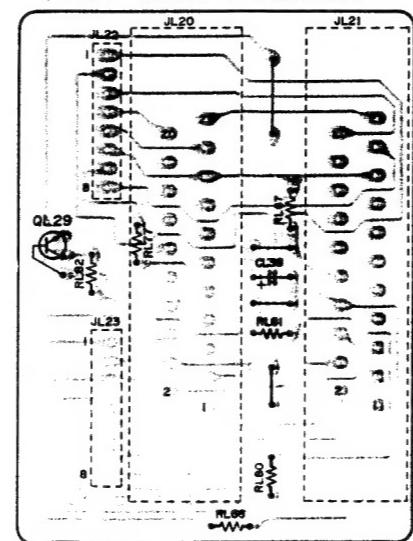
PAI4 – RELAY (E) VERSION



PA14 - RELAY (A,N,T,W) VERSION



PL24 - R.G.B. CONECTOR



## P704 - POWER AMP DRIVER

